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FEW CHANGES IN 1907 FRENCH MODELS

By W. F. BRADLEY.

PARIS, Nov. 6.—So far as can be gleaned by frequent visits to the large automobile factories in and around Paris, changes in chassis construction will not be numerous next year. New models are being created, minor details have received close attention and undergone modification in many respects, but no manufacturer has departed in any important feature from his last year's models. A large number of firms will produce six-cylinder machines, but as in each case these embody all the well-tried features of their four-cylinder cars, there is little of the experimental about them. Consequent upon the introduction of sixes, a slight reduction in the price of high-power four-cylinder cars is likely.

It would appear that the great mass of automobiles, consisting of all the medium-power touring machines, have reached such a state of perfection, and are now established on such universally accepted lines, that changes are impossible. Only at the two extremes of the list, among the lordly sixes and in the modest runabout for the man of modest means, is interesting work being done. One or two important French firms have become alive to the possibilities of doing business in lower-powered economically-produced automobiles for the masses. The demand for the moderate-priced vehicle has become too general to be longer ignored, and many firms are making preparations to supply this market. The Darracq firm is an example of this. Near their exist-

ing factory at Suresnes has been erected a huge building especially for the construction in large series of small runabouts. An interesting model has been established and by the end of next month the first series ought to be ready.

The model is a single-cylinder machine, 105 mm. bore and 120 mm. stroke, rated at 7-9 horsepower, ignition by accumulators, three forward speeds and reverse, with direct drive on high, cardan shaft transmission, equal wooden wheels 700 by 85, track 43 inches, wheelbase 77 inches, total weight, with two-seated body, 1,100 pounds, selling at \$760. In its main lines the voiturette resembles the firm's larger touring cars, the engine being carried forward under a bonnet, radiator in usual position, steering column and wheel, cone clutch, gear box and transmission to live axle by propeller shaft and bevel gears. A distinguishing feature is that chassis and bodywork are one. Each side frame has stamped out with it a single bucket seat. On the two frames being united a complete chassis and skeleton body is formed providing for two individual seats side by side. Strength, lightness and economy of production are combined. For the cheapest class of runabout no more satisfactory method of body construction could be found than this exceedingly practical idea.

A larger voiturette on similar lines is also built, but with a two-cylinder engine, 90 mm. bore by 120 mm. stroke, rated at 8-10 horsepower. Wheelbase remains the same, but the



NEW POSTER FOR THE TENTH SALON DE L'AUTOMOBILE.

track is increased to 47 inches, the weight being 1,322 pounds. Selling price is \$960, with an increase of \$60 for double ignition by magneto and sparking plugs. The Darracq light cars for 1907 comprise three models: a single-cylinder 8-10 horsepower, a two-cylinder 10-12 horsepower and a four-cylinder 16-18 horsepower, the two latter being made with either long or short chassis for tonneau or double-phaeton side-entrance body. There are two models of four-cylinder touring cars, each of 20-28 horsepower, differing only in their change-speed gear. Finally, there will be a six-cylinder machine with cylinders 100 mm. bore by 120 mm. stroke, two ignition systems, four forward speeds and reverse through triple sliding gear, giving direct drive on the high. Transmission is by cardan shaft, with double joint between the gear box and the motor to rear live axle. Wheelbase is 131 inches and track 53 inches. With double-phaeton side-entrance body the six-cylinder car is listed at \$8,200. A Letombe self-starter is fixed on the 20-28- and 30-40-horsepower models for \$200 extra. Instead of the change-speed lever being placed under the steering wheel, as in present Darracq cars, it will next year be on the side of the car, along with the brake lever, for all the larger touring machines.

The Brasier Types.

The Brasier firm will present two types next season, a 16-26 and a 30-40 horsepower, both with countershaft and final drive through side chains to rear wheels. The chassis is built rather lower than formerly, its height from the ground now being 24 instead of 26 inches; the radiator has also been placed further back, giving to the machine an additional air of speed and stability. To allow of a more comfortable body, the rear width of chassis has been increased by six inches, now making 39 inches; the front, on the other hand, has been narrowed to 31 inches to give easier turning.

Bayard-Clément Remains About the Same.

Bayard-Clément states that their 1907 models will not materially differ from those of this year. The 10-12-horsepower short chassis has been abolished, all the other models remaining the same. Ignition by magneto and sparking plugs will be employed on the larger touring machines, but all other Bayard features have given so much satisfaction that it has not been found necessary to make changes. To meet the demand for high-grade machines at a low price four new models have been created. Listed at \$1,300 is a two-cylinder two-seated runabout with an 8-10-horsepower engine of 85 mm. bore and 110 mm. stroke. At \$1,500 is a four-cylinder 10-14-horsepower machine, cylinders 75 by 90 mm. bore and stroke, wheelbase 88 inches. The same car is made with a long chassis for side-entrance body at \$1,580.

Mors to Have Only Two Models.

The Mors factory will produce nothing but four- and six-cylinder cars next year. The 10- and 15-horsepower models will have four cylinders cast in one block, the 17-, 28- and 45-horsepower chassis carry four cylinders cast in pairs, while the 50-horsepower model is a six-cylinder. The 10-horsepower chassis is intended for cab service; both it and the 15-horsepower model intended for town use have been especially designed to give silent running. These two models will have cardan shaft transmission to rear live axle, all the other and more powerful machines being fitted with chain drive. Mors high-tension magneto is used on all types.

Hotchkiss Four- and Six-Cylinders.

Hotchkiss is another high-class firm producing only four- and six-cylinder models. The fours will be similar to this year's models with a few minor improvements. The six-cylinder is an entirely new type, and one that has received very close attention at the hands of the engineers of the famous St. Denis gun and automobile factory. To accom-

modate the larger engine the wheelbase has been increased to 132 inches, being one foot longer than any of the four-cylinder cars. There is, however, a wide steering angle and the big machine is quite manageable in the dense traffic on crowded streets, as has been proved by trial runs through Paris. The track is 4 feet 11 inches, the space available for coach work 8 feet 8 inches; from dash to tangent of wheel in 67 inches, allowing for a full-sized side entrance without any cut away at inner corner. The frame is of pressed steel of the usual channel section, raised at the rear and narrowed at the front. Long semi-elliptic side springs are employed, and there is no rear transverse spring. The engine, which is bolted direct to the side frames, has three pairs of cylinders 115 mm. bore by 120 mm. stroke.

All cylinders are ground dead true by American machinery. Camshafts and cams are machined together out of the solid, inlet valves being placed on the right and exhaust valves on the left side. Ignition is by Eiseman gear-driven swinging magnets worked off the exhaust camshaft. The new Mann carburetor used on this year's racers is employed. It is interesting to note the arrangement of inlet pipes. Directly from the carburetor is a double arm pipe entering the main feed pipe running the entire length of the three pairs of cylinders at a point exactly between each pair. Having exactly the same distance to travel, an even supply of gas is assured to each cylinder. Ball bearings are used throughout, even in the crankshaft, according to Hotchkiss practice. No important changes have been made in transmission, the six-cylinder car having cardan shaft to rear live axle, as in the smaller models.

Hotchkiss, Darracq and Renault are the only European firms constructing powerful automobiles with live axle, and we believe that the Hotchkiss and Darracq vehicles will be the only sixes next season without side chains. A saving in weight has been effected in both the gear box and the differential casing, both these organs being particularly compact in the new model. Four forward speeds and a reverse on one lever are provided, with direct drive on the high gear, the change-speed lever being of the locking gate type. Two sets of brakes are fitted, one of the exterior double-acting type on the motorshaft behind the gear box, worked by a foot pedal, and hand-lever brakes on steel drums on road wheels, these latter being entirely inclosed. Although rated at 35-45, the engine gives 50 horsepower on the brake.

Mercedes and Others to Have Six-Cylinders.

Mercedes is another firm turning its attention to six-cylinder cars. There will be three models next season, a 35-horsepower and a 45-horsepower each with four cylinders and a 75-horsepower machine with six cylinders. Only the first two models have yet reached Paris. Structural changes are slight. An entirely new carburetor has been fitted, known as the Von Soden, heated by a hot water circulation from the radiator instead of hot air from the exhaust. In place of the chain-driven pump there is now a level gear. The lever on dashboard cutting off gasoline supply to engine has been abolished in favor of a switch similar to that used for an ordinary electric lamp. Air vents have been cut in the sides of the bonnet. All other features remain as last year.

Renault, Charron, Girardot & Voigt and Bayard-Clément all announce that they will not construct six-cylinder cars. Three years ago the C. G. V. firm produced an eight-cylinder model, but it was not considered advisable to continue its manufacture. Bayard-Clément has under construction three powerful six-cylinder racers and is paying some attention to the six-cylinder question for touring machines, but will not build for the public until a thoroughly satisfactory model is discovered, and certainly not during 1907. The Léon Bollée firm will add a six-cylinder car to the present four-cylinder series, and the same will be done by Itala.

HOW THEY CLIMBED THE GAILLON HILL

PARIS, Oct. 29.—Darracq again led the field in the climb up the Gaillon hill in Normandy yesterday. A strong wind had been blowing for some hours with the result that the magnificent kilometer track with its 10 per cent. grade had been made absolutely dry and yet dustless. When Tampier gave the start in the heavy racer section Lee Guinness took his eight-cylinder 200-horsepower Darracq car over the line in fine style.

ing gear and the bursting of a tire, swung across the road twice, striking a tree and a telegraph post and finally overturning. The Bayard-Clement racer only left the factory about six weeks ago, was entered for the Ventoux hill climb, but withdrawn at the last moment owing to a slight mishap, and was looked upon as likely to give the Darracq trouble on the Gaillon hill. Two other machines of the same type are at present under construction at the Bayard factory.

In the light racer class, 401 to 650 kilos, Darracq was just as successful as among the heavier, Demogeot lowering Hemery's record of 32 3-5 to 29 seconds, representing an average of 77.5 miles an hour. Villemain on a Bayard came second and Gladiator and Gregoire took respectively third and fourth positions.

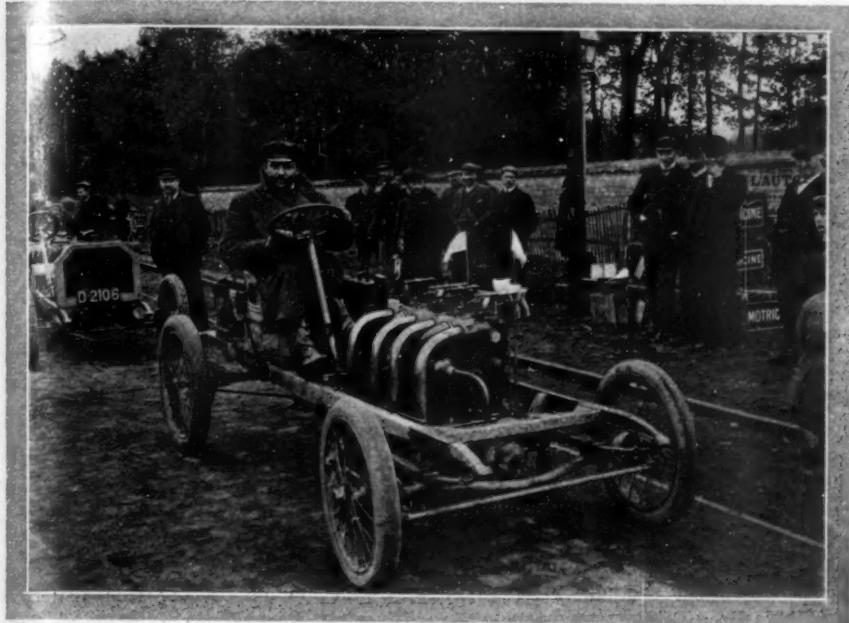
An interesting feature of the meeting was a race for taximeter motor cabs, won by a 30-40-horsepower four-cylinder Chenard & Walcker, especially built for public service on the Riviera. A 20-horsepower, from the same factory, doing a daily service in Paris, was a good second, while a little single cylinder Corre cab came third.

Tourist performances did not offer more than a local interest. Entries were good, but owing to the numerous sub-divisions not more than an average of four was left for each section. All the tourists had been engaged in the straightaway runs at Dourdan the previous Sunday and had to climb the Gaillon rise with the set of gears used on that occasion.

The following is the official classification in the racing section:

FLYING KILOMETER ON 10 PER CENT. GRADIENT.
HEAVY CARS, 651 TO 1,000 KILOS.

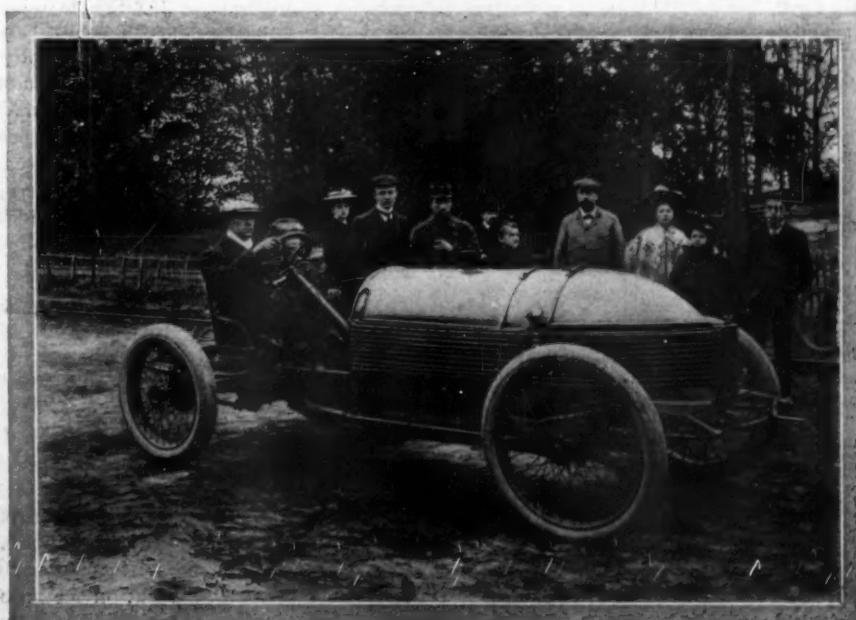
1. Darracq (Lee Guinness), 200-h.p., 8-cyl.; Dunlop tires...	:26
2. Napier (Cecil Edge), 90-h.p., 6-cyl.....	:29
3. Itala (Longchamps), 100-h.p.....	:34 3-5
4. Mercedes (Lévy), 60-h.p.....	:41



DEMOGEOT IN PRIZE-WINNING DARRACQ LIGHT RACER.

When the tape was reached the machine was running magnificently and flew up the hill at a pace never before seen at Gaillon, maintaining a course as straight as if it were on rails. "Twenty-five seconds," said the businesslike Tampier. Rigoly's (Gobron Brillié) and Baras' (Darracq) record of 29 seconds for the flying kilometer had been easily beaten by the Englishman's performance, representing 89.4 miles an hour. Dunlop tires with Samson anti-skid bands on the rear wheels were used on the victorious Darracq. The machine is the one first driven by Hemery on the Salon-Arles road last December, when the kilometer was put at 20 3-5. Better time was done in Florida, and since Lee Guinness bought the racer he has placed the European flying kilometer at 19 seconds in the Ostend Meeting and beaten all comers at Blackpool, Dourdan and Gaillon. Yesterday Cecil Edge, on a 90-horsepower six-cylinder racer came second in 29 seconds. A 100-horsepower Itala driven by Longchamps registered 34 3-5 seconds, and M. Lévy's Mercedes was clocked at 41 seconds.

The heavy racing section was robbed of much of its interest by the non-appearance of the new six-cylinder Bayard-Clement racer. Garbet de Vauresmont was giving the machine a final tuning up on the hill when he came into collision with a cart containing six people. Neither the occupants of the cart, the chauffeur and his mechanic, nor the horse were seriously injured by the compact. Both vehicles, however, were smashed up, the racer, owing to a disorganization of its steer-



CECIL EDGE IN 90-HORSEPOWER 6-CYLINDER NAPIER.

LIGHT RACERS, 401 TO 650 KILOS.		
1. Darracq (Demogeot); Continental tires.....	:29	
2. Bayard-Clement (Villemain)	:33 4-5	
3. Gladiator (Mallon)	:39	
4. Gregoire (Tillette)	:39 1-5	
Previous record, Hemery (Darracq).....	:32 3-5	
VOITURETTES LESS THAN 400 KILOS.		
1. Vulpes (Barriaux); Dunlop tires.....	:46 3-5	
Record, De la Touloubre (Darracq).....	:40	
MOTORCYCLES, LESS THAN 50 KILOS.		
1. Peugeot (Cissac); Wolber tires.....	:27 4-5	
2. Peugeot (Giuppone); Wolber tires.....	:29 2-5	
Previous record, Lanfranchi (Peugeot).....	:29 3-5	
MOTORCYCLES, MORE THAN 50 KILOS.		
1. Anzani (Anzani), one-seated machine	:45 4-5	
2. Motori-Contal (Pons), two-seated machine.....	:47 3-5	

DON'TS BY A FOURTEEN-YEAR-OLD AUTOIST.

Miss Eva Brunell is a fourteen-year-old autoist, of Worcester, Mass., and in the course of her experience she has accumulated a few don'ts, some of which are well worth remembering. From a long list displayed in the garage of her father the following are culled:

Don't drive too fast.
Don't be dirty. Don't lose the coil plug.
Don't forget to get a license.
Don't take your friends out riding when you are testing an automobile.
Don't forget to put enough gasoline into the tank.
Don't think every girl thinks you are IT because you run an automobile.
Don't think every one with an auto cap and goggles owns an auto.
Don't try to race every auto you see.
Don't think because you are driving an automobile for someone else that gasoline doesn't cost anything.
Don't forget to shine the brass occasionally.
Don't laugh at the fellow who is stuck on the road; you may be the next one.
Don't, don't forget Quinn in Leicester.
Don't start on a tour without preparation for all emergencies.
Don't drive too fast over rough roads.
Don't be inconsiderate of highway laws.
Don't fail to stop if everything is not working all right.
Don't forget to get a guidebook.

INDEFATIGABLE GLOBE-GIRDLER GLIDDEN ON HIS WAY

CHARLES J. GLIDDEN is now en route westward to Chicago. After attending the banquet of the Automobile Club of Springfield, Mass., the route included New York City, Philadelphia, Gettysburg, and Washington, and thence back to New York and West. Referring to an experience met with in Maryland not far from the District of Columbia line, Mr. Glidden says:

"Stop or I'll shoot" was the salutation we received from a man riding along with us on a bicycle a few miles from the District of Columbia line in the State of Maryland. We halted, and he returned the revolver to his pocket. "Did you know you were driving that machine thirty miles an hour and the laws of Maryland limit the speed to twelve? Come back and see the magistrate."

We had just passed a small voting place surrounded by a few politicians. The magistrate was telephoned for. The officer called me to one side and said: "The fine is from \$5 to \$50. How fast do you really think you were going?" "About eighteen miles an hour," I replied. "All right, if you will do the right thing I won't press you very hard, and it won't cost you much." "Let him go," shouted a man in the crowd. We waited an hour; the magistrate failed to appear. Finally, the officer said: "I will accept \$12 for your appearance at court to-morrow, but it is not necessary for you to appear." I paid the money and drove on, reaching Washington late in the evening.

An Interview with Mr. Glidden at York, Pa.

YORK, PA., Nov. 12.—With his big Napier touring car covered with the dust of the Keystone State, Charles J. Glidden, accompanied by Mrs. Glidden, and Miss Waldron, and Machinist Charles Thomas, arrived in this city a few days ago on his way

HOODLUMISM TOWARD JERSEY LAWMAKER.

TRENTON, N. J., Nov. 13.—The automobile of Senator Joseph S. Frelinghuysen, of Somerset County, was nearly wrecked the other day by a large touring car on the road near Millstone. Senator Frelinghuysen's big Pierce machine was speeding along at a moderate rate when a large red automobile containing four men overtook it. At the sound of the horn, the driver of the Senator's machine ran to one side of the road to allow the other to pass.

According to the chauffeur's statement, the red car slowed down, steered for the Frelinghuysen machine, and two men leaned out of their seats and showered a volley of oaths at its occupants, and then shot ahead and hooked the front wheel with a force that nearly overturned and threw it in the ditch by the side of the road. The red automobile, little damaged by the collision, sped out of sight, while Frelinghuysen's car was much battered. In the excitement, the occupants of the Senator's car failed to notice the number of the offender before it disappeared in a cloud of dust.

Senator Frelinghuysen has not been in favor with automobilists since he passed his law, but this is the first indignity that has been shown his vehicle on the road. He is making every effort to capture the offenders.

FORTY-ONE GALLONS AND 687 MILES.

ARDMORE, PA., Nov. 12.—The Autocar Company is sending to its agents an economy table telling in detail the performance of an Autocar runabout which in the period of nine days covered 687 miles with forty-one gallons of gasoline, the route starting from New York, and thereafter including Tarrytown, Garden City, Shelter Island, Fall River, Boston, Springfield, Bridgeport, Tarrytown, and to the point of beginning in New York City. An average of 16.55 miles per gallon was secured, and the total average cost per mile (gasoline, engine oil, kerosene, batteries and repairs) was 189-100 cents. The forty-three hours' running time brought an average of 15.26 miles per hour. The highways traveled over were of all kinds, including many hills and both macadam and dirt roads.

from Boston to Mexico City. When seen by THE AUTOMOBILE representative, Mr. Glidden spoke in favor of a Southern trip for the A. A. A. tour next summer. He said:

"I understand that Mr. Post has been through this locality looking up the condition of the roads. The trip from New York City to Norfolk, Va., would make an ideal tour with such fine side attractions as the Gettysburg battlefield and the Jamestown exposition. The roads are plenty good enough for the tour."

Talking of the roads that he had experienced since leaving Boston, Mr. Glidden said: "The run this far has been very good. The scenery has been one of the distinctive features of the trip. The roads can be referred to as being fair. When we speak of excellent and good roads, we naturally think of the fine boulevards of France and the parkways and drives in the larger cities. Out of New York for a considerable distance we had good roads, and the same was true near Philadelphia, but since, we have struck the fair ones."

A part of the Pennsylvania roads that Mr. Glidden cannot get accustomed to, is the "breaker" or "bumper," as it is more commonly called. These "bumpers" are put on the road more for drainage than anything else, and are the most discouraging thing on the thoroughfares. They are about 100 yards apart, and an autoist no sooner gets his machine running properly than he has to put on the brake, or send his entire party soaring into the air. Mr. Glidden, like other tourists, is of the opinion that these objectionable obstacles should be removed.



ELSIE JANIS FIRING THE SHOT THAT STARTED THE 50-MILE TOURING CAR CHAMPIONSHIP RACE AT PHILADELPHIA.

QUAKER CITY'S SUCCESSFUL TRACK MEET

PHILADELPHIA, Nov. 12.—A record-breaking crowd, a record-breaking "park" of automobiles, and some very fast time, with weather of the ideal sort, combined to make last Saturday's initial meet of the Quaker City Motor Club a most enjoyable affair.

The race of the day was the 50-mile championship for the Philadelphia *Inquirer* cup and open to all makes of touring cars. Eight cars showed at the tape—Stevens-Duryea, R. Johnson; Packard, Ernest Lash; Pope-Toledo, Frank Yeager; Apperson, Phil. Kirk; Oldsmobile, Ernest Keeler; Thomas, Ernest Kelly; Darracq, W. Wallace; and Crawford, Eddie Wilkie. At the gun—which, by the way, was fired by Elsie Janis, the actress, now here with "The Vanderbilt Cup"—the Olds jumped to the front, and led to the first turn after the completion of the first mile, where the Stevens collared it, only to lose the lead to the Olds on the third mile. At the finish of the fourth mile the Stevens again rushed to the front. On the back stretch in the fourth mile something broke on the Packard, and that machine came to an abrupt stop—so suddenly, in fact, that Kelly in the Thomas smashed into him, badly damaging both machines, but fortunately injuring nobody. Just here the spectators were given a practical demonstration of the workings of the new White ambulance, now connected with the Municipal Hospital. When the crash was heard the steamer was called for, and in a trifle over a minute was speeding around the outside edge of the track at a clip which compared quite favorably with some of the trailers in the race. The services of its white-coated crew, however, were not required.

An Exciting Contest, the Spectators on Edge.

From the fourth mile the Stevens looked all over a winner, although the Olds—against which a protest had been filed, on the ground that it was a Vanderbilt Cup car—hung on like a leech. On the sixth the Stevens-Olds combination began to catch the tail-enders, the Apperson and Crawford being the first victims; on the ninth the Pope joined the "lap-behind" list, and on the twelfth the Darracq was added. The order was Stevens—Olds—Darracq until the nineteenth mile post had been passed, when the Stevens went to the bad, owing to spark troubles. This was Keeler's opportunity, and he made the most of it, although he could not shake off Wallace in the Darracq, which, though a mile and an eighth behind, refused to yield another inch. The procession was Olds—Darracq—Pope from the twentieth to the thirty-fifth mile, the figures per mile being between 1:05 and 1:07

all through this period. The Olds' lead stood Keeler in good stead, for although he had to stop for tire trouble on the twenty-third round, he got going again before the Darracq could catch him. But the latter would not be denied, and when Keeler was compelled to stop in the thirty-fifth—again the tires—Wallace seized his advantage, and went to the front, the Pope also passing the Olds and slipping into the place.

Keeler got going again when the Darracq was about a mile and a half ahead, and although he succeeded in collaring the Pope, Wallace managed to keep most of his lead, and at the finish he was over a mile to the good. The time, 1:01:20 1-5, is a track record, beating Ernest Kelly's 1:02:19 3-5 in a 50 Thomas last August. The Pope finished third, and the plucky Crawford, about 3 1-2 miles to the bad, captured fourth place, much to the delight of the many local friends of its driver, Eddie Wilkie.

Other Events Had Their Interesting Features.

The win of the three-mile steamer handicap by B. A. Parsons' 10-horsepower White (200 yards) from the two scratch 20-horsepower Stanleys was a pretty bit of driving on the former's part. The time, 3:25 1-5, was not the least meritorious feature of the performance.

The "antique" race was most amusing. It was at two miles, and some of the long-mark cars were wonders. Kelsey's limit car, the Kelsey, a three-wheeler, with single rear-wheel drive, was so slow it couldn't reach its mark in time, and it was "left at the post." The next car, Joe Keir's 6 1-2-horsepower Darracq, was spreadeagled by the entire back-field before the quarter-pole on the first lap was reached. The winner was Morris Wood's 28-horsepower Mercedes (scratch), which negotiated the two miles in the creditable time of 2:52 2-5.

The winning of the free-for-all championship by D. Walter Harper was another good piece of driving. Harper seemed to have immense reserve power, but his high-hung car necessitated coasting on the turns, when the pursuing gasolines would move up, only to be left on the straights.

In the five-mile race for foreign touring cars, Wallace in his 40-60-horsepower Darracq again scored, his only rival, H. B. Stillman's 35-Mercedes, being easily beaten in slow time.

Walter Christie, who came down to see the races in his famous Vanderbilt Cup car, was induced by the management to go two exhibition miles. Mr. Christie obliged, but took no chances on the rough track with its dangerous turns, and the

crowd, which was evidently looking for an under-the-minute mile, had to be content with 1:03 2-5 and 1:08. The summary:

THREE MILES, GASOLINE CARS COSTING \$1,500 OR LESS.

1. Buick, 22-h.p.; driver, W. E. Haupt.....	4:00
2. Elmore, 11-h.p.; driver, H. L. Newton.....	

THREE MILES, STEAMER HANDICAP.

1. White, 10-h.p.; driver, Robert Crapp; 200 yds.....	3:25 1-5
2. Stanley, 20-h.p.; driver, D. Walter Harper; scratch....	
3. Stanley, 20-h.p.; driver, M. T. Dobbins; scratch.....	

TWO MILES, ANTIQUE HANDICAP (CARS BUILT NOT LATER THAN 1904).

1. Mercedes, 28-h.p.; driver, Morris Wood; scratch.....	2:52 2-5
2. White, 10-h.p.; driver, Robert Crapp; 25 yds.....	
3. Elmore, 11-h.p.; driver, H. L. Newton; 75 yds.....	

THREE MILES, MOTORCYCLES.

1. Simplex, 5-h.p.; driver, W. H. Wray, Jr.....	3:53 2-5
2. Curtis; driver, A. L. Hilaman.....	
3. Davidson; driver, Alex Klein.....	

FIVE MILES, FREE-FOR-ALL CHAMPIONSHIP.

1. Stanley, 20-h.p.; driver, D. Walter Stanley.....	6:33
2. Pope-Toledo, 35-h.p.; driver, Frank Yeager.....	
3. Apperson, 60-h.p.; driver, Philip Kirk.....	

FIVE MILES, SPECIAL MATCH RACE—ELSIE JANIS CUP.

1. Packard, 30-h.p.; driver, C. G. Embleton.....	6:09 4-5
2. Pope-Toledo, 35-h.p.; driver, Frank Yeager.....	
3. Darracq, 40 to 60-h.p.; driver, E. Wallace.....	

FIVE MILES, FOREIGN TOURING CARS—KEIR-MICHELIN CUP.

1. Darracq, 40 to 60-h.p.; driver, E. Wallace.....	6:36 3-5
2. Mercedes, 28-h.p.; driver, H. B. Stillman.....	

FIVE MILES, AMERICAN TOURING CARS (FULLY EQUIPPED).

1. Stanley, 20-h.p.; driver, D. Walter Harper.....	7:12 1-5
2. Jackson, 24-h.p.; driver, W. Owens.....	

FIVE MILES, GASOLINE, COSTING LESS THAN \$2,000—DIAMOND TIRE CUP.

1. Buick, 22-h.p.; driver, W. Haupt.....	6:38
2. Rambler, 35-h.p.; driver, A. H. Bitner.....	
3. Crawford, 35-h.p.; driver, E. Wilkie.....	

FIFTY MILES, TOURING CAR CHAMPIONSHIP—"INQUIRER" CUP.

1. Darracq, 40 to 60-h.p.; driver, W. Wallace.....	1:01:20 2-5
2. Oldsmobile, 35-h.p.; driver, Ernest Keeler.....	1:02:41 2-5
3. Pope-Toledo, 35-h.p.; driver, Frank Yeager.....	
4. Crawford, 35-h.p.; driver, E. Wilkie.....	

Five-mile times:

5.....	5:54 1-5	30.....	36:10
10.....	11:34 3-5	35.....	42:22 3-5
15.....	17:15 2-5	40.....	49:10 1-5
20.....	23:00	45.....	55:14 4-5
25.....	30:08 1-5	50.....	1:01:20 2-5

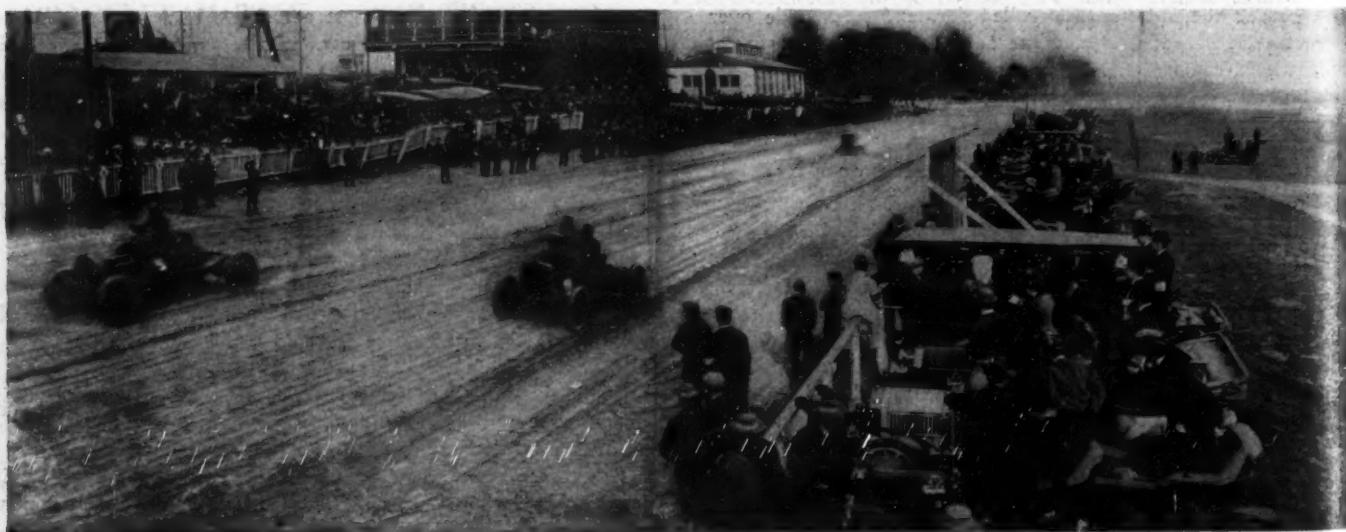
ACCIDENTS MAR WAVERLY PARK WINDUP.

NEWARK, N. J., Nov. 10.—The unfinished program of Election Day remained unfinished when darkness set in to night. After Koehler and his Buick had participated in a special race, wherein the Bird gave the Buick too much start and failed to catch its rival in the five miles traveled, the heats of the 25-mile handicap were run off and then the final. On account of approaching darkness it was decided that ten miles would be the distance of this final. A Packard finished first, with the Buick second and the Pope-Hartford third. The latter car, driven by Apgar, mistakenly continued after the completion of the ten miles, lost a tire and skidded into a crowd of spectators, striking several and demolishing a strong board fence. One man was seriously injured and taken to the hospital in a critical condition. This accident resulted in an immediate conclusion of the races. In one of the trial heats of the same race William Schutt, driving a Buick car, had smashed into the fence, torn the front axle completely off his car, but miraculously escaped injury himself.

The Waverly Park track is a half-mile affair and does not permit of excessive speed. The Newark *Sunday Call* makes the following comment: "The unfortunate ending of the two race meets held within a week of each other may sound the knell of track racing by automobiles in this part of the state. The local motoring events held previously have never resulted so seriously. Not a little comment has been caused by the fact that fatal accidents have been averted both times only by good luck and the stoutness of the fence bordering the track. Had there been the crowd present yesterday at the races that was in attendance at the meet on Labor Day or Election Day, there is no possibility that serious or even fatal accidents to a large number of people could have been averted."

FRENCH WINTER RELIABILITY TRIAL.

Invitations have been extended to all the principal French automobile manufacturing firms by the Automobile Club of France to participate in the reliability trial for touring cars which will be run from November 25 to December 5. Start will be made from Paris, and daily runs of 150 miles will be made to Nice, in the south of France, where a three-days' exhibition will be held. The return journey will be made by similar stages to Paris in time for the opening of the Salon de l'Automobile. Each firm competing has a right to enter three cars of their catalogue type, with motors of a maximum bore of 130 millimeters. An average speed of about 22 miles an hour will be maintained. Competitors will be penalized for late arrival at each night stop.



WILLIAM WALLACE WINNING 50-MILE RACE AT PHILADELPHIA WITH HIS 40-60-HORSEPOWER DARRACQ.

SANTOS-DUMONT ON THE VERGE OF SUCCESS

PARIS, Nov. 12.—Santos-Dumont made a series of experiments with his perfected aeroplane in the Bois de Boulogne this morning. He made two flights of between five and six seconds, covering between fifty and sixty meters each time.

In the afternoon M. Santos-Dumont met with better success, and was only prevented by the immense crowds which surged on the field from accomplishing a long flight. He skimmed along at a height of fifteen feet and at a speed of thirty miles per hour for a distance of 215 meters, when fear that his whirling propeller would strike the cheering people forced him to descend. The right wing of his machine was slightly damaged.

The principal change in the aeroplane to-day was that the side-rudder reins were attached to the shoulders of M. Santos-Dumont, who operated them with instinctive movements of the body. He was thus completely successful in preventing the rolling motion of the machine.

Commenting upon to-day's performance the *Herald* states: "It was certainly a true moment of triumph for the principle of 'heavier than air.' Those who had seen the flight had no doubt that the problem of mechanical flight was solved. For them a

by the air. In the case of an opposing wind the aeroplane can ascend even more easily in the teeth of the wind, but more slowly.

During M. Santos-Dumont's trial the apparatus was moving at a speed of about thirty-two feet a second. Now if the apparatus were launched against a wind with a speed of sixteen feet a second it would make a net progress of only sixteen feet, the same as a bird whose speed relative to the ground is equal to his own velocity diminished by that of the opposing wind. The aeroplane, thanks to its propelling helix and with its head to the wind, can keep itself balanced at a speed equal to that of the wind in an opposite direction and can thus ascend or descend in one spot. In a calm the aeroplane would descend to earth with a velocity which would be precisely the minimum necessary to sustain it in the air. It would roll along the ground and again become an automobile.

"In succeeding," concludes M. Levavasseur, "M. Santos-Dumont opens to humanity the aerial routes. Man has made the conquest of the air!"



PRES. BISHOP AND EX-PRES. HEDGE, AERO CLUB OF AMERICA

few alterations, a little more speed and the flying machine becomes a tremendous reality.

"Two prizes fall into M. Santos-Dumont's hands by the performances to-day. Both were offered by the Automobile Club de France. The first is 100f., to the aeronaut traveling 100 meters. There is no prize for 200 meters, or, naturally, M. Santos-Dumont would have taken that.

"I am very pleased," said the champion of the hour to the *Herald* correspondent, when he had been liberated from his friends, "but am also very disappointed that I was prevented from completing a much greater distance by reason of the stupidity of the crowd, which in its eagerness to see everything came beneath my machine. I have every reason to think that I should have covered a kilometer at least, as I was well in the air, perfectly balanced, and my motor was working exceedingly well. I shall be glad if for my future experiments I can get permission from the authorities at Longchamps to employ the racing field, which, being railed in, would leave me free to operate without interference from an excited multitude of spectators."

In an article in the *Monde Illustré*, M. Levavasseur, constructor of the extra light motors which have rendered such service to automobilism, auto-boats and aerostatics, explains the process. The aeroplane starts on the ground like an automobile, with two parallel wheels not very far apart. The speed enables M. Santos-Dumont to keep the apparatus horizontal, supported

JAMESTOWN'S AERONAUTIC FEATURES.

NORFOLK, VA., Nov. 10.—Visitors to the Jamestown Exposition next year will witness probably one of the greatest aeronautic exhibits ever got together at any one time in the United States. It will consist of the exhibit of airships, balloons, and other aeronautic apparatus; demonstrations, indoor and outdoor, and various experiments by the best known experts in the world. Probably the most scientific work will be the aeroplane experiments.

The first step toward having aeronautical work at the exposition was taken recently when the board of governors indorsed the proposition of August Post and J. C. McCoy, prominent members of the Aero Club of America, to get together a general committee from the exposition, the Aero Club, and the War Department, to take up the subject and formulate plans for a great exhibition. As a result of this action by the governors, letters were sent to many of the most prominent aeronauts of this country and those interested in the science, asking them to serve on the general committee and to meet at the Hotel Astor, New York City, on the evening of November 14, to map out the work. Messrs. Post and McCoy visited Norfolk, where they spent some time in conference with the exposition officials.

PRESIDENT BISHOP WINS HAWLEY CUP.

PITTSFIELD, MASS., Nov. 9.—The automobile pursuit of the balloon *Orient* was participated in by six automobiles. President Cortland Field Bishop, of the Aero Club of America, was the winner, he arriving at North Adams, where the balloon descended, in time to assist in pulling the big gas bag to the ground. Alan R. Hawley, another prominent member of the Aero Club, giver of the cup which Mr. Bishop won, accompanied J. C. McCoy, in the *Orient*.

THE VILLE DE PARIS MEETS WITH AN ACCIDENT

PARIS, Nov. 12.—Henry Deutsch's new steerable balloon, the *Ville de Paris*, had its initial trial this morning. With four passengers aboard the balloon behaved fairly steady, but when high speed was attempted a breakage in the engine compelled a quick descent. In making the descent the motor was somewhat damaged, owing to the breakage of the frame, which collided with the ground with some force.

Nine balloons participated Sunday in the pursuit contest with automobilists.

PROPOSED AUTO TAXATION IN OLD BAY STATE

BOSTON, Nov. 12.—Massachusetts autoists have in prospect a lively fight at the beginning of the new year when the legislature begins its sessions. The contest is not to be over speed limits or punishment clauses, but on the question of taxation. There is an element in the State that would like to tax the automobiles for "what the traffic will bear," and many of the towns and cities that are laboring under heavy State taxes will grasp at any sort of solution that tends to lighten their burden. The matter is just now being considered by a joint special recess committee of the Legislature, which was appointed to give hearings and devise ways and means of raising additional State revenue, without increasing the direct tax upon the towns and cities.

The automobile and automobilists were thought by some members of this committee to offer a fair mark for an additional excise tax, and the committee has given a number of hearings on the matter, at which it has taken a considerable amount of testimony tending to show that the cost of maintenance of the best roads, particularly the State roads and the boulevards, has been materially increased since the advent of the heavy and fast touring cars. The State Highway Commission, itself, has estimated that it will need \$50,000 additional appropriation annually to maintain the State roads that have been stripped by the automobiles. Cities and towns are also crying out that the automobilists should pay for damage to their roads, though for several centuries it has never been the custom in Massachusetts to make the traffic pay the cost of road maintenance.

The matter has progressed so far, even, that a schedule of an annual fee for automobiles graduated according to horsepower has been drafted, which, if put in effect, would yield the State a very large additional income. The committee has traveled some about the State and has found ready support for the proposed scheme, so that it is not at all unlikely that when it makes its report to the Legislature it will include a recommendation for an annual fee from automobilists.

The owners of motor vehicles are preparing to oppose any such legislation, and they will urge as the basis of their argument that an annual fee would be double taxation, as the machines are taxed as personal property in the places where their owners reside. Furthermore, it would be entirely opposite to the traditions of the State, which has regarded the maintenance of the highways as the duty of the whole people, as everybody is benefited by the opportunity to use them. It will be argued that it is as equitable to make the owners of horses pay the expense of street cleaning in the cities as it is to call upon the automobilists to pay the cost of maintaining the roads which they use most frequently. Furthermore, the automobilists will be prepared to show that the damage to the roads caused by automobiles is exaggerated. The cars, when driven at speed, do tend to pull off the surface of macadamized highways, but their action in raveling the stones of the road has not been as great as was anticipated. Raveling occurs mostly at corners where the cars tend to skid.

Fifty Thousand Dollars in Fees Estimated for 1907.

The statistics of the automobile department of the Highway Commission for the present year also give the automobilists a good argument against additional taxation. These statistics show that for the present year the income in registration and license fees will not be far from \$35,000, which is about \$10,000 more than in 1905 and nearly double the income of 1903. At the present rate of increase in the rise of automobiles the State next year will receive in fees under the present law a sum of approximately \$50,000, which is the amount the Highway Commission says is necessary in addition to the regular appropriation for maintenance of State roads.

The growth of the use of automobiles in Massachusetts is shown

by the following table. The figures for 1906 are to November 7, inclusive:

	1903.	1904.	1905.	1906.	Totals.
Automobile certificates	3,241	3,772	4,889	6,393	18,295
Mfrs.' and Dealers' cts.....	100	80	102	149	431
Motorcycle certificates	502	489	533	664	2,188
Licenses (private operators) 3,907	3,586	3,736	4,514	5,241	15,743
Licenses (prof. chauff.).....	692	1,335	3,133	5,241	10,401

The highest number plate issued by the commission to November 7 was 17,343, the difference between this and the number of certificates issued being accounted for by the fact that the commission permits an owner when registering a new machine to retain his old number. As chauffeurs have to renew their licenses every year, the total of 10,401 is not significant, the number for 1906 indicating the total number of professional chauffeurs now holding licenses. About 2,000 of the 5,241 are renewals, indicating that about 3,000 have entered the business this year. An officer of the commission has figured that about seven per cent. of the professional chauffeurs licensed are women.

The income of the State since it undertook the supervision of automobilists and automobiles is shown by the following table. The figures for 1906, as in the table above, are to November 7, inclusive:

Year.	Fees Received.
1903.....	\$17,688.00
1904.....	19,166.00
1905.....	24,490.50
1906.....	32,154.50

A NEW SAN FRANCISCO-LOS ANGELES RECORD.

STOCKTON, CAL., Nov. 8.—Fernando Nelson has broken the record from San Francisco to Los Angeles in the same 45-horse-power Columbia he used in breaking the record from Stockton into the Yosemite Valley, the record still standing. Nelson left San Francisco at 10 o'clock Wednesday evening and reached Los Angeles at 4:13 o'clock Thursday afternoon, having covered the 512 miles in 18 hours 13 minutes, the best previous time for the distance being 21 hours 4 minutes, held by a Franklin. The route is over four different mountain ranges and is extremely dangerous. The fastest time for express trains between the two points is 16 hours. Over twenty-five different attempts have been made to break this record within the past month, but aside from the Franklin clipping off eight minutes from the best previous time of a White steamer, none succeeded until Nelson shattered it. Nelson had no occasion to repair or adjust his car during the entire trip.

AEROCAR CO. TO HAVE A WATER-COOLED CAR.

DETROIT, MICH., Nov. 12.—The rumor going the rounds of the trade for several weeks to the effect that the Aerocar Company will build a big water cooled touring car for 1907 has been confirmed by that concern. The new car will be known as Model "F," and will have plenty of power, being equipped with a four-cylinder motor, developing a minimum of 40 horsepower. It has been tried out several months under varying road conditions and has covered several thousand miles. It is a large touring car, 112 inch wheelbase and will seat five passengers very comfortably.

In addition to the Model "F" the Aerocar Company will also continue to manufacture its air-cooled line with which it has been so successful during the past season. It will now be in a position to give the purchaser a choice of either an air-cooled or water-cooled car.

The use of automobiles is rapidly increasing in South Africa. Johannesburg now has over 700 registered cars.

THE DEBATABLE PROBLEM OF SIDE SLIP

By THOMAS L. WHITE.

THE question of wheel skid and wheel slip is one which finds the practical chauffeur and the expert physicist very much on an equal footing. Any driver who, on negotiating a stretch of greasy road, has found his car waltzing diagonally across the track and himself facing the direction he came from, is open to interpret as freely as he pleases the causes of the evolution he has executed without much fear of contradiction; for all physical science can tell him is in substance that in such cases the driving wheels have a tendency to follow a path which is not the path of the front wheels, and that if this tendency is realized the car will first gyrate and then describe a curve called a tractrix. On the point of remedies, constructional, or manipulative, calculated to overcome such tendencies, Professor Darwin and other distinguished mathematicians, who have looked into the question, have singularly little to say, and that not very practical. Their analysis is no doubt valuable, especially as a step, but at the moment it can hardly be said to meet the requirements of the man on the car whose interests are more concerned with the actual elimination of skidding than a study of its nature. For him not "How we skid," but "How not to skid," is the final issue.

If, however, mathematical physics is more or less dumb on the practical point, it by no means follows that the resulting equality of the automobile man and the theorist need be an equality of ignorance. It is open to each to learn from the other, the theorist by accepting what *does* happen and by arguing less about what *should* happen, the layman by looking a little below the surface of the actual facts which come within his experience and getting a grip on their quantitative relations. And this is all the easier since, in such cases as can arise in the class of problem we are considering, the intuition of common sense and the reasoning of science march together. All that is needed on the one side is accuracy, on the other, experience. Let the man on the car remember that mathematical physics has solved some tough problems in the past, and the professor in the chair recollect that facts count first, and we shall have such a happy marriage of theory and practice as will be prolific in benefits to all concerned.

A moving automobile under control may be described at any instant as a system in a state of steady motion, whose center of gravity tends to follow a rectilinear path, and whose control as to deviations from that path is entirely effected by the reaction of the frictional resistance of the roadbed. It is when the latter fails, when it becomes unequal or uncontrollable in its effect, or when it is called upon unduly that trouble comes. All questions of skidding and sideslipping are thus at bottom friction questions and a clear conception of the nature and laws of friction is necessary to dissect them.

On the principle of *lux e non lucendo* the motorist's debt to friction is well illustrated by the purely imaginary conception of an automobile at rest on an *absolutely smooth* level road. It is up to the chauffeur to go ahead, and his dilemma is what to do. Turning the motor on is manifestly useless, for the driving wheels would simply revolve *in situ*. Equally to no purpose will it be for him to get out and try to pull the car along, for his feet, like the driving wheels, will have no grip. The only expedient open to him is to take a flying jump out of the car, depending on the dynamical principle that if the center of gravity of a conservative system is once at rest it will remain at rest in the absence of external reaction, so that if one part of the system (the chauffeur) slides away in one direction, the rest of the system (the car and contents) will slide away in the opposite direction with equal momentum.

In all seriousness, friction, in its nature a passive resistance,—that is, a resistance which is only called into existence to resist motion,—is paradoxically enough the one condition which renders practical motion possible at all. The bird may regard the pressure

of the air as a simple hindrance to its flight, but that pressure is nevertheless the very thing which enables it to fly.

When two substances are in contact and there is a tendency for the one to slip over the other, the amount of friction which will come into play to prevent motion will increase as the tendency to motion increases until a certain limit is reached. This is known as the Limiting Friction and its magnitude is:

- (1) Constant for the same two substances;
- (2) Proportional to the pressure between the two substances;
- (3) Independent of the contacting areas of the two substances;
- (4) Constant when motion ensues.

It is usual to denote the ratio of the Limiting Friction to the mutual pressure of the substances between which it is exerted by the letter μ . For an automobile wheel, supposing it running freely, μ has the value .6, that is to say, .6 of the pressure of the wheel on the ground can at most be called forth to prevent the wheel from slipping sideways. If the automobile wheel is locked, the Limiting Friction to counteract sideslip is much smaller and the value .35 for μ may be taken as covering average experience. This means in practice that

if at the moment of taking a sharp turn a driver puts on the brake his car will be much more likely to skid.

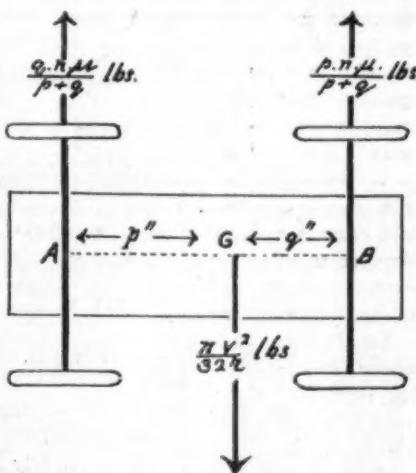


FIG. 1.

The simplest case of the action of friction in preventing sideslip and one which brings out very clearly the conditions under which a car will upset instead of skid is that of a racing car running on a level circular track. Supposing that the radius of this track is r feet, the questions arise:

- (1) How fast can the car go without slipping?
- (2) How fast can the car go without upsetting?
- (3) Will it slip or upset first?

As the consideration of these points will clear the way for the more difficult questions which arise in connection with sideslipping on a straight road we shall deal with them first.

Let the velocity of the car along the track be v feet per second. Then it can be mathematically shown that the centrifugal action on the car, as a whole, which is resisted by the action of the wheels as a whole, at their contact with the ground, is equal to $\frac{nv^2}{32r}$ pounds, where n is the mass of the car in pounds. This force, it can also be shown, may be considered as acting through the center of gravity of the car. Let us suppose further (see Fig. 1) that the weight of the car is so distributed that the center of gravity is situated p inches from the front axle and q inches from the rear axle.

Then the weight on the rear axle will be $\frac{pn}{p+q}$ pounds, and if the rear wheels are on the point of slipping the resisting friction will be $\frac{p\mu n}{p+q}$ pounds, and we have, on the supposition that the hind wheels will slip before the front wheels, by taking moments about A (Fig. 1)

$$p \times \frac{nv^2}{32r} = (p+q) \frac{p\mu n}{p+q}$$

that is

$$\frac{v^2}{32r} = \mu$$

This result is independent of p , q , and n , which shows that the sideslipping of a car running on a circular track is independent of all considerations of its weight or of how that weight is distributed. We have already seen that $\mu = .6$ which gives, by substitution in the last equation,

$$v^2 = 19.2 r.$$

From this result a curve can be plotted out giving the values of v corresponding to the various values of r . It can be easily constructed, for if we draw a straight line and take a point distant from 19.2 inches from it, every point on the curve is equidistant from

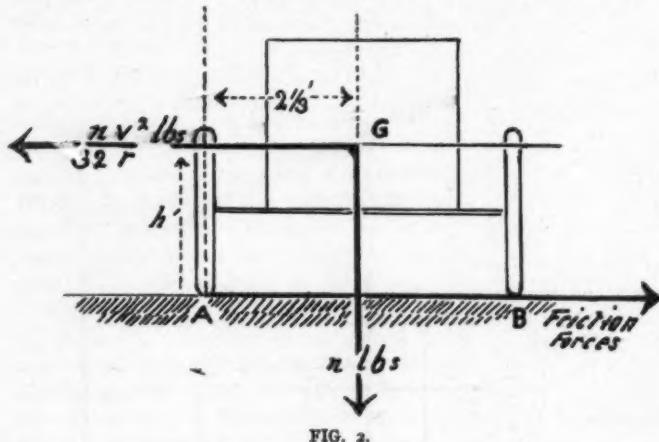


FIG. 2.

the line and the point. In other words, the "skidding curve" for a circular track is a parabola.

We have just seen that, so far as slipping is concerned, the distance of the center of gravity from the front and rear axles is a matter of indifference. This is clearly also the case, so far as overturning is concerned, and consequently Fig. 2, which is a section of a car taken through the centers of the driving wheels, may be considered as containing the center of gravity, G , which in reality it would not. For a similar reason we may consider the entire action of the friction to take place along AB , which joins the contact points with the ground of the two driving wheels. It will be noticed that the friction force is not in this case necessarily μn pounds, but something smaller, for in most cases of upsetting the Limiting Friction is not called into play. As is usual, let AB equal 56", and let the height of G above the road surface be h feet. As before, let us assume the car to be running with a velocity v feet per second on a level circular track whose radius is r feet, so that the centrifugal force through G is $nv^2/32r$ pounds. Let us now conceive of the car as just on the point of overturning about A and at the same time as on the point of slipping. The force of friction will now be μn pounds (Limiting Friction), and taking moments about A we get

$$\frac{nv^2}{32r} \times h = 213 \times n$$

But as the car is about to slide

$$\frac{nv^2}{32r} = \mu n$$

which gives

$$(\mu n) \times h = 213 \times n$$

whence $h = \frac{213}{\mu} = \frac{2.333}{.6} = 3.9$ feet.

This means that taking $\mu = .6$ as the usual Limiting Friction between a vehicle wheel and the road, 3.9 feet is the maximum height for the center of gravity of a car whose wheel tread is 56" to insure that slipping will always occur before overturning.

It should be noticed in passing that in the case of a bicycle and its rider turning a corner, the conditions of the problem are quite different. In such a case there is always sufficient instinctive leaning over inwards by the rider to insure that the resultant

of the centrifugal force and his weight, both of which pass through some point within his body, shall intersect the wheel contact line, so that the only thing to be feared is sidestep. In the case we are considering, the resultant of the centrifugal force and the weight of the car is acting along GA (Fig. 2), and a slight increase of h will make that resultant act outside of A , which, of course, means that the car will upset.

To resume, instead of considering that the car may either slip or upset, let us consider the connection between v and r , where h is great enough to insure that the car will upset before slipping. We have, then, by taking moments about A (Fig. 2),

$$\frac{hnv^2}{32r} = 213 \times n$$

$$\text{or } v^2 = \frac{74.6 r}{h}$$

Suppose that h equals 4 feet and we get $v^2 = 18.6 r$. The curve plotted out from this equation is also a parabola. In fact, for the values of h between 3'-6" and 4'-0", the "skidding curve" and the "upsetting curve" almost coincide, which indicates an unstable condition generally at critical speeds.

(To be continued.)

ALCOHOL DENATURING PRIZES.

Vice-Consul-General Paul H. Cram, of Marseilles, furnishes the conditions of the competition instituted by the French government, with the object of discovering a denaturing agent for alcohol, and a system for the utilization of alcohol as an illuminant. The following is a translation of the official promulgation:

Articles 2 and 3 of the law of November 29, 1905, institute two prizes: One of 20,000 francs (\$3,860) in favor of the person who shall discover an agent for denaturing alcohol more advantageous than the denaturing agent actually known, and offering to the treasury every guaranty against fraud; other than 50,000 francs (\$9,650) in favor of the person who shall discover a system permitting of the utilization of alcohol for illumination, under the same conditions as petroleum. The commission of analytical methods has drawn up the following conditions to which competitors must conform:

(1.) The denaturant must offer an odor and taste which render it repulsive to the mouth; for this reason are eliminated the must of wine or of dates, the essence of thyme, rosemary, spikenard, rosebay infusion, etc.

(2.) It must not present an odor too pronounced or so repulsive as to interfere with the domestic and industrial uses of the denatured alcohol, thus excluding the employment of acetylene, of asafetida, of garlic essence, etc.

(3.) It must not be constituted by a soluble substance which, by leaving a deposit on the wicks or in the mountings of the lamps, would hinder the combustion of the denatured alcohol—as, for instance, marine salt, sulphate of soda, alum, chlorhydrat of ammonia, ferrocyanide, acid pleric, infusions of wine dregs and residues, tobacco juice, tincture of aloes, etc.

(4.) It may not be constituted otherwise than by a substance perceptible more or less volatile than alcohol, which, apart from other drawbacks, would allow of its elimination by fractional distillation. Among the substances excluded from this motive are to be noted in the first category, ether, sulphuret of carbon, the light essences of petrol or of pit coal, and in the second category, essence of turpentine, cresyl, carbolic acid, petroleum, coal tars, tars of bog-head and of birch trees, camphor, naphthaline, etc.

(5.) It must not contain any substance capable of attacking the metallic parts of lamps or motors, such as ammonia, nitrobenzine, chlorine phenoles, sulphuric acid, sulphuret of carbon, etc.

(6.) It must not be toxic, such as bichloride of mercury, cyanide of methyl, arsenate of soda, aniline, nor must it contain any poisonous substances, such as the extracts of henbane, aconite, or of digitalis, etc.

(7.) It must be sufficiently economical not to hinder the domestic and industrial uses of the denatured alcohol.

(8.) It must not exist normally in the alcohols of commerce.

(9.) It must permit of the easy and certain detection of its presence in denatured alcohol.

(10.) Finally, it must, according to the terms of the law itself, be more profitable than the present denaturant, and offer to the Treasury every guaranty against fraud.

Full latitude is left to inventors, provided that, in conformity with the law, the system presented permits of the utilization of alcohol under the same conditions as petroleum. Inventors should address their propositions, systems or devices, "accompanied by a written description," to "Monsieur le Chef du Service des Laboratoires du Ministère des Finances, 11, Rue de la Douane, Paris."

HOW TO IMPROVE AN OLD CAR*

By VICTOR LOUGHEED.

THE muffler is one of the worst minor features of many old cars. Before the construction of the device was as well understood as it is to-day, many an otherwise excellent engine was handicapped with the necessity for emitting its exhaust into the outer air, by way of a muffler that set up a by no means inconsiderable back pressure, certain to waste power.

Should anything of this sort happen to be the case with a car that it is desired to improve, it goes almost without saying that a good modern muffler is a first essential to the desired betterment. Or perhaps it will be possible to bring the old muffler up to date by some modification of the internal partitioning, using some good present-day muffler as a model.

A muffler cutout, if none is provided, is a good thing to have on any car. It is not merely that a cutout may permit a slight increase of power by the possible elimination of every vestige of back pressure; to the trained ear it has a greater value in that it discloses by the unsilenced exhaust the least disturbance in the engine's functioning.

Means of Improving the Lubrication.

At an earlier period in the history of the mechanically-propelled road vehicle lubrication was provided generally as an apparent afterthought. Nowadays it is recognized as one of the most important details of the complete mechanical assemblage, absolutely vital to the proper and satisfactory working of every other part of the car. And since modern lubricating devices are refined to a standard that had no prototype in the past, the fitting of a first-class forced-feed or measured-flow lubricator to an old car will rarely prove ill-advised if the car is worth any fixing at all.

It will be necessary, of course, in deciding upon the details of this improvement, to determine the number of bearings to which the new lubrication may be applied most advantageously and then provide a lead to each of these bearings. If a pressure-feed system is used it may be necessary to make a connection from the engine exhaust; while if the oiler is a mechanical one a belt, chain, or gear drive of some sort will be required.

What Can Be Done to the Transmission.

In the transmission of an old car there is not likely to be any opportunity for very extensive changes unless the spending of considerable money seems justified. Aside from such going over as the bearings will require, it will be found more often practicable to replace rather than to repair. New chains, gears, sprockets, etc., may be necessary, in which case possibly the substitution of better stock may prove expedient. The use of alloy steels in place of the cold-rolled and tool steels that used to be used for sliding gears, for instance, is eminently desirable, though it rarely will be possible at a reasonable price, unless exceptional good fortune is encountered in finding something that just happens to fit the given case.

Usually, the best that can be done with sliding gears, if their teeth are badly worn or broken, is to secure new ones of the kind that were used.

In planetary and individual-clutch gear systems the gears are less likely to require renewal than with sliding gears, unless they have encountered exceptionally hard service.

Renewal of Sprockets and Chains.

Chains invariably require renewal every so often, so replacement in this particular is likely to improve things. If it should happen that block chains have been the older equipment, these can be replaced advantageously with roller chains, which hold lubricant better, waste less power, and wear sprockets less, besides being

less affected by dust and mud. Their use will require, however, sprockets with more numerous and differently cut teeth.

A simple expedient that can be applied in many cases of badly-worn sprockets is simply to reverse them, so that the unworn faces of the teeth come against the chain pull. Many sprockets are made symmetrical on both sides, to permit of such reversing.

Correcting the Faults in Spring Design.

The springs of an out-of-date car are likely to merit several sorts of criticism, with consequent call for correction of a wrong condition. They may be of poor design or they may be sagged or broken, for instance.

Poor design is most likely to be manifested in the use of an insufficient number or of unduly short leaves. Or it may be present in the form of thick and narrow and therefore comparatively inflexible leaves.

For any of these defects, replacement with better springs is the only cure, unless the difficulty is solely with the number of leaves, in which case it is not difficult to add one or two by way of reinforcement.

Broken spring leaves can be corrected only by replacement, but if the breakage seems to be due, as is often the case, to the presence of large holes at their point of attachment to the axle, to provide for a massive holding bolt, current practice is good practice to come to here. This approves only the smallest cross bolt, for keeping the springs aligned, the real work of holding being done by clips that go over and outside of the leaves, not through them.

Springs that have sagged—simply bent down under load—are not likely to repay any tinkering expended to straighten them. The fact that they should have bent is almost a more serious reflection on their quality than breakage would be, and may be taken to indicate a degree of weakness, making it impossible for them to stand up under the work required of them. Perhaps retempering, which in a pinch can be done by a good blacksmith, will help, but it is doubtful, and replacement is by all means better.

The lubrication of springs, even on the current models of cars having a high reputation, rarely is provided for as is desirable. Prying the blades apart occasionally with a screwdriver, and inserting a quantity of graphite-containing grease, is an attention that will hurt no car that has seen service. A hole tapped through all the spring leaves but the bottom one, and provided with a force-feed grease cup, is a convenience not to be despised, and surely any convenience is an improvement.

The Overhauling of Minor Details.

The distance or radius rods on any car with single or double-chain drive are very likely to need attention if the car has been maintained by incompetent hands. Not only is there likely to be lost motion, due to wear in the bearings, but there also is the possibility of deranged parallelism of the rear axle, due to one rod being longer than the other, with the result that tire wear is rapid and the car steers badly.

New pins or bushings, or both, according to the construction that is used, will overcome the lost motion due to wear, while to correct maladjustment of the rods possibly the best plan is to equalize the distance from front to rear hubs, on both sides of the car, by the use of a tape line. While this is done, the front wheels must, of course, be placed perfectly straight, as for steering directly ahead.

Torsion rods, used in shaft-driven cars, are subject to wear, and such wear must be taken up if smooth running is expected. Usually there is provision for all necessary adjustment at this

*Continued from page 606, issue of November 8.

point, but if there is not, lost motion must be eliminated even at the cost of replacement of parts.

Clutch Repair and Remodeling.

The clutch of a car can cause a great deal of trouble, no matter how good its condition, if it is of bad or obsolete design. The early cone clutches without self-contained end thrust were particular offenders, and one of these can be vastly bettered by inverting it, running a spring stud through its center or otherwise providing means of removing the end thrust from the shaft bearings. The friction surface, too, is likely to need renewal, and a new clutch leather will work wonders. In an extreme case of unsatisfactory construction it may be expedient to exchange one type of clutch for another, especially if slipping seems to occur, as a result of insufficient friction surface. A good disk clutch, particularly, is not hard to fit in the place of almost any other kind.

The band clutches of the average planetary gear are another case in point where the renewal of friction surfaces is sure to improve working.

On some old cars trouble may be found in a cone clutch, due to a disalignment of the countershaft and the clutch shaft. The difficulty in all probability will be directly traceable to some distortion of the frame, consequent upon severe road shocks, but an easier plan than that of attempting to straighten the frame may be found in making the clutch self-centering. To do this, connect the male member of the clutch with its shaft by means of a universal joint, Oldham coupling, or some equivalent, so that it can slant slightly if necessary to come into perfect engagement.

To Improve Brakes and Strengthen Axles.

Besides renewal of friction surfaces, the chief possibility in the way of improving the brakes of an old car is to make them compensating—so that they apply to both wheels equally, irrespective of any slight differences in adjustment. The use of a wire cable, along lines immediately apparent upon examination of two out of three up-to-date cars, is the simplest and quickest way to arrive at the desired result here.

Sagged axles are one of the occasional inheritances from the earlier era of untried materials and immature design. A truss rod, properly applied, is probably the least expensive correction of the tendency, both dangerous and unsightly, toward spreading of the wheels through upward bending of axle ends.

The Importance of a Perfect Steering Gear.

Since the integrity and proper action of the steering gear often is a matter of life and death, no doubtful detail of an ancient car should receive closer scrutiny. The steering gear is not a thing to take chances with, and any questionable construction should be made indisputably safe. A weak connecting rod or drag link, showing the least tendency to buckle, should be discarded for a stronger one, or else reinforced with wired-on wooden bars. Worn bearings—pins or eyes—must be made good, no matter what expense is involved. Especially important is the nature of the provision for keeping pins from dropping out, and split keys or something better must be used liberally for this purpose. Grease bags for lubrication of the joints between the various connections will insure reasonable continuance of good condition, once it is secured.

Though of no particular effect upon satisfactory operation, wonders in the appearance of a car can be worked by remodeling of its body. A modern hood, alone, even though it be a "dummy" hood, will reduce greatly an offending unsightliness. And side entrances instead of rear, long wheelbases instead of short, and comfortable seats instead of uncomfortable, are too obviously desirable to require enumeration of their specific advantages.

The date for great annual touring contest in Sicily, the Targa Florio, next year has been set for April 21.

PRESSURE LUBRICATORS MUST BE CLEAN.

Air pressure is frequently used to force oil to the bearings, the oil tank having a space left above the oil for air under pressure and the oil flowing through simple openings to the pipes. The greatest objection to this type of lubricator is that in case one outlet becomes obstructed there is but little pressure behind the oil and the obstruction is liable to remain in the passage, while the oil will continue to flow, possibly in increased volume, through the unobstructed ducts. Nevertheless, the air pressure system has been very extensively used, especially on foreign cars, with excellent results, and there is no reason why trouble should occur as long as the lubricating system is kept absolutely clean and the oil carefully strained.

In some engines the oiling system is enclosed in the crankcase of the engine itself, and is designed to be entirely automatic. A tank formed in the crankcase is located low down, and from it a gear driven pump sends oil through passages formed in the crankcase casting to the various engine bearings. There is a pipe leading to the dashboard, where a small pressure gauge is located. This indicates the back pressure in the pipe line and shows that the pump is working properly. Strainers in the system keep the oil clean.

Check valves are in some cases placed in the feed pipes near the bearings, so that the oil in the pipe cannot run out when the engine is not running. The valve is held on its seat by a light spring, which is easily raised by the pump pressure, but will not open otherwise. This not only prevents flooding when the engine is standing, but keeps the pipe full so that lubrication commences with the first stroke of the pump.

OFFICIAL COMMENTS ON DENATURED ALCOHOL.

Internal Revenue Commissioner Yerkes says that even though the production of wood alcohol should be controlled by a trust, the manufacturer of denatured alcohol will not necessarily be controlled by the same organization, as wood alcohol is not the only denaturant, and it will be easy to find substitutes, while the regulations could be easily changed.

The question has been submitted to the Internal Revenue Bureau by druggists, manufacturers, distillers and others concerning fire risks, and the Commissioner wishes it understood that persons desiring to handle denatured alcohol need have no uneasiness about fire risks in connection with the use of that article; that the benzine prescribed will be a hydrocarbon obtained either from petroleum or coal-tar having a specific gravity of not less than 8.00 and a boiling point of not less than 150° C. The benzine will not be a particle more dangerous, from the point of view of fire risk, than the alcohol itself, or many other articles whose presence in buildings does not add to the fire risk or call for a higher rate of insurance.

RESULT OF NEW BRITISH REVENUE ACT.

The first result of the British revenue act, 1906, which has just come into force, has been the formation of a convention among makers of methylated spirit, states a writer in the London *Times*, who says:

The revenue act provided for the use by manufacturers of a special methylated spirit on which the board of inland revenue grants a rebate of 5d. (10 cents) per gallon. The makers of this spirit, however, are only quoting at 4d. per gallon below the old price, instead of 5d., as anticipated. The price of methylated spirit, of the kind which could be used for motor cars if it were cheap enough, remains unchanged for the present. In Germany, where the use of duty-free alcohol for manufacturing and motive purposes has been allowed for many years, the spirit industry has also come into the hands of a trust, with the result that the advantages which should accrue from the use of an untaxed spirit are becoming smaller. Had competition in the English market in industrial alcohol continued there was every possibility of our manufacturers being able to produce certain articles as cheaply as the Germans, but there are distinct signs that competition is at an end.

LETTERS INTERESTING AND INSTRUCTIVE

The Mysteries of Timing.

Editor THE AUTOMOBILE:

[467.]—Will you kindly tell me through your paper the best way to go about regulating the vibrator? I have a pound in my engine every time I put in a new set of batteries, and think the trouble lies in a poorly-adjusted vibrator.

A SUBSCRIBER.

So. Nyack N. Y.

It is one of the seemingly unavoidable minor defects of the average high-tension system, using coils and vibrators, that every time the battery is renewed readjustment of the vibrators is more or less necessary. The reason for this appears to be a matter of magnetic lag in the coils and mechanical lag in the vibrator blades, both of these forms of lag varying with the current strength. With a strong current, they are least, while with a weak current they rise to a maximum. Therefore, assuming that you have the point of commutator contact advanced one-third of the way into the compression stroke—to take probably an extreme instance—with a comparatively weak current the lag of effect may be such as to delay the actual recurrence of the spark to dead center. By now replacing the partly rundown cells with new ones a sharper action will be secured, and, with the same point of contact, the spark may occur enough before dead center to produce the pound to which you refer. Adjusting the vibrator so as to strengthen the spring or to increase the distance of contact separation, will compensate for the increased current strength, and thus may be made a means of regaining an approximation to the conditions as they existed with the weaker current. In the same manner, weakening the vibrator spring and bringing the contacts closer together increases the speed of effect with a weak current and enables a run-down battery to be utilized longer than would be possible otherwise. There is a growing belief among experts that timing of the spark, because of any considerations applying to the interior of the engine, is less necessary than has been supposed. This theory is borne out by almost every indicator diagram that ever has been taken from an internal-combustion engine. Invariably the rise of pressure from the moment of first ignition to the moment of maximum pressure is enormously fast—many times faster than can be effectively utilized with the rates of expansion permitted by the piston-speed limitation in the ordinary engine. Usually this period for full combustion occupies about one-sixteenth of the power stroke in an automobile engine, even with ignition at dead center and a very high rotative speed. Further support of the theory is found in the Renault and Brasier practice of dispensing with ignition timing, in the one case, with high-tension ignition, by dispensing with the coils, and in the other, with make-and-break, by special means to insure almost instantaneous separation of the contacts. With the commoner systems of electric ignition, timing is necessary because the lags involved occupy always a certain time—with a given condition of vibrator adjustment and current strength—while the arc of commutator advance corresponding to this time varies with every variation in the speed of the engine. There is little doubt but what many a user runs his car at times with the ignition so far advanced that power is lost in the compression stroke by working against the explosion and in the working stroke by the sacrifice of the initial impulse. With this condition occurring, there is less to disclose it than is commonly imagined, so long as the momentum of the moving parts is great enough and the load is light enough to carry the motor over against the undue negative work in the compression strokes. It is only when the load is heavy and the effect is so pronounced as nearly to stall the engine that the "knock," usually relied upon as a sufficient indication, is heard. In adjusting your trembler properly, the only sure way is to adjust it by trial rather than by rule, leaving it in the condition that affords the best results. Its sound is some guide, but only a vague one.

A Variety of Troubles.

Editor THE AUTOMOBILE:

[468.]—I would like to have you answer a few questions in regard to trouble I am having with my two-cylinder touring car. First, I will say that I have adjusted my needle valve in carburetor to where motor runs to the best advantage on both low and high speeds, and no flooding of carburetor is noticed when engine is not running. Now, when engine is running slow, gasoline drips from a hole in intake pipe between carburetor and cylinders, but when speeded up this dripping stops. Should this be so, and if not, what is the cause and remedy? Would this apparent flooding cause motor to overheat so as to boil the water in cooling system? One cylinder skips when running slow but explodes regularly when speeded up. What would cause this? Are the connections made correctly in cooling system, as per drawing? An answer at your earliest convenience would greatly oblige an interested reader and subscriber to your magazine.

GEORGE A. MAYO.

East Milton, Mass.

Because you fail to state the make of your car it is less easy to give a satisfactory answer than might be the case otherwise. Apparently, when your engine is running slow, the suction draws more gasoline from the atomizing nozzle than the air inspired

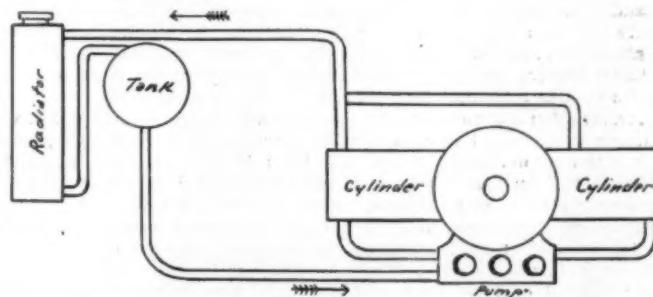


DIAGRAM OF PROPER ARRANGEMENT FOR CIRCULATING SYSTEM.

can take up, with the result as you state it. At higher speeds, the greater quantity of air, at a greater velocity, may pick up all the gasoline, perhaps even without completely evaporating it. The difficulty is such as may be due to too large a diameter of nozzle opening, or to too high a fuel level in the float chamber. Possibly the height of the float requires adjustment. Overheating often is due to too rich a mixture, and would follow naturally enough upon the other conditions. It may be either carburetor or ignition trouble that makes the cylinder skip when running slow. See if the commutator is in good condition and especially note if any of the surfaces are in such condition as to depend upon centrifugal force for effective contact. If it is the carburetor that is at fault, it may be that the mixture at low speeds is too rich to fire, but becomes leaner as the motor runs faster.

A Difficult Proposition.

Editor THE AUTOMOBILE:

[469.]—Kindly let me know through your next issue the best way to mount a Cadillac motor in an Orient buckboard. Explain the changes and material required. Thanking you in advance.

P. H. SIMONS.

We are very sure that the most satisfactory answer to your question is to discourage your proposed plan. An Orient buckboard is not adapted either in weight or design for propulsion by a heavy motor, and a Cadillac motor requires a transmission and other accessories that it would be altogether impracticable to install on a very light, low vehicle. The result, if you were to accomplish it, would be likely to come as far from having your own approval as that of the Cadillac or Orient people. It would be scarcely possible to mount the Cadillac motor high enough on the buckboard for its flywheel to clear the ground, without producing a construction so topheavy that it would

be in danger of tipping over. Make some measurements, and see if this is not the case. As for giving details of changes and material required, this would take pages of our space, and would require as a preliminary much data you have not given us. You do not even say whether you mean the Cadillac runabout motor, nor, if so, which model, but we trust that you have not in mind the four-cylinder Cadillac engine. It will be well for you to consider that the cost of such extensive remodeling as you propose is invariably much greater than that of a better car than you could hope to produce.

A STRONG ADVOCATE OF THE SIX-CYLINDER.

Editor THE AUTOMOBILE:

[470.]—Mr. Waldron conveys the impression that during his foreign trip the English house he visited was the Napier Company, but he is careful not to say so, and there are a dozen British makers who have turned out six-cylinder cars. S. F. Edge, managing director of the Napier Company, the largest manufacturer in England, has stated in the motor press, over his signature, that 80 per cent. of their output for 1906 was six-cylinder cars.

The writer has driven and made many sales of 60-horsepower six-cylinder cars of a standard American make during the past season, and his experience shows that six cylinders of moderate dimensions are better from every point of view than four cylinders. There is less shock, less noise, greater flexibility, and no greater liability to trouble than in the four cylinders. One customer says: "It is the most wonderful creation in the automobile line that ever struck the Coast. No four-cylinder car can approach it for power, speed, and absolute absence of noise and vibration. As you know, I drive my own cars, and the Big Six handles as easily and turns as readily as any touring car, while the engine is, of course, far more flexible in its control than any four-cylinder."

Mr. Waldron's argument against the six-cylinder is that it is not coming into general use; to turn his weapon against his own product it is only necessary to say that there is no other American and but one foreign maker who puts his transmission on the rear axle, or fits an additional lever to operate the reverse gear.

The fastest gasoline car ever built, Demogeot's Darracq, has eight cylinders, and it is the writer's opinion that had the cylinder capacity of Foxhall Keene's Mercedes been divided among six cylinders instead of four, he would not have been thrown out of the Vanderbilt race by a broken cylinder.

Los Angeles, Cal.

LLEWELLYN H. JOHNSON.

MORE ABOUT CONNECTING SPEED INDICATORS.

[471.]—In answer to Dr. Burke's letter of November 3 and your editorial in your issue of November 10, in regard to connecting speed indicator to driving shaft or mechanism of the mobile, I wish to say that such a connection is impractical as well as almost impossible. The slippage of the rear wheels is too great to allow the instrument to record within reasonable limits of accuracy, even under good conditions of the road and tires.

I was at one time engaged in testing the efficiency of an electric runabout. It was in the fall of the year, roads frozen but not slippery. The rear wheels revolved at the rate of twelve miles per hour while the vehicle traveled at the rate of nine and one-half miles per hour. This slippage took place in the propelling wheels; the steering wheels at the very most did not slip more than one revolution per mile.

There is no way in which a standardized attachment could be placed on the driving mechanism because of the great variety in the construction of mobiles on the market. The manufacturers of automobiles would not care to go to the expense of providing a "projecting shaft," and if they did it would not eliminate the flexible shaft because of the number of angles necessary to bring the driving power to the dash. Each bend or angle would necessitate a bevel gear or universal connection, which would be impractical.

If the gears are properly attached to the front wheel with the pinion behind the steering knuckle and are kept free from oil they will wear indefinitely. The Winchester Speedometer Co. (formerly McGlehan) use composition bronze gears and have no trouble from wear or breakage where the above directions are followed.

The Winchester Speedometer is geared in accordance with and from exhaustive measurements taken from tires in all conditions and under all conditions and is one of the few accurate instruments now on the market.

J. C. WINCH,
Vice-president Winchester Speedometer Co.
New York City.

A QUESTION OF COMPENSATION.

Editor THE AUTOMOBILE:

[472.]—In reply to letter No. 458, as to missing of carburetor, would say that the tendency of an uncompensated carburetor is

to give a richer mixture as the speed increases, other things being equal. The symptoms as F. L. M. describes them point to a tendency to give a weak mixture at high speeds and a strong one at low speeds, therefore the carburetor is over compensated. Since increasing the speed either by spark or by throttle causes missing, the probability is that the carburetor is compensated by an automatic air valve. If this is the case the remedy is to slightly increase the tension of the automatic air valve spring. The mixture given by the carburetor at speed or under load with a wide opening of the needle valve is probably due to the mixture being about correct; at slow speeds, however, the missing with this adjustment of the needle valve is probably due to too rich a mixture caused by faulty compensation.

Boston, Mass.

HAROLD H. BROWN.

THIS MAN WANTS A CHANCE.

Editor THE AUTOMOBILE:

[473.]—Can you kindly inform me, through "The Automobile," to which I have been a subscriber for some time I am glad to say, how I may get with some automobile factory in the assembling or testing department? I have had experience in running and repairing both foreign and American cars, but I am unable to get with any factory in this line. How in the world can anyone learn if some one don't give him a chance?

ONE WHO TRIED.

Detroit, Mich.

CONNECTICUT MAY LICENSE DRIVERS.

NEW HAVEN, CONN., Nov. 12.—A proposed bill to be considered by the Legislature, which will meet in Hartford during January, would compel all drivers of motor vehicles to be licensed. This movement is partially the result of a number of serious automobile accidents in Connecticut during the past summer. Mayor G. M. Landers, of New Britain, Conn., an autoist himself, is also very much in favor of the proposed legislation, claiming that it is much needed in his vicinity. The great majority of autoists, however, are against the proposed act, claiming that it is entirely unnecessary, and only an additional damper on the automobile industry.

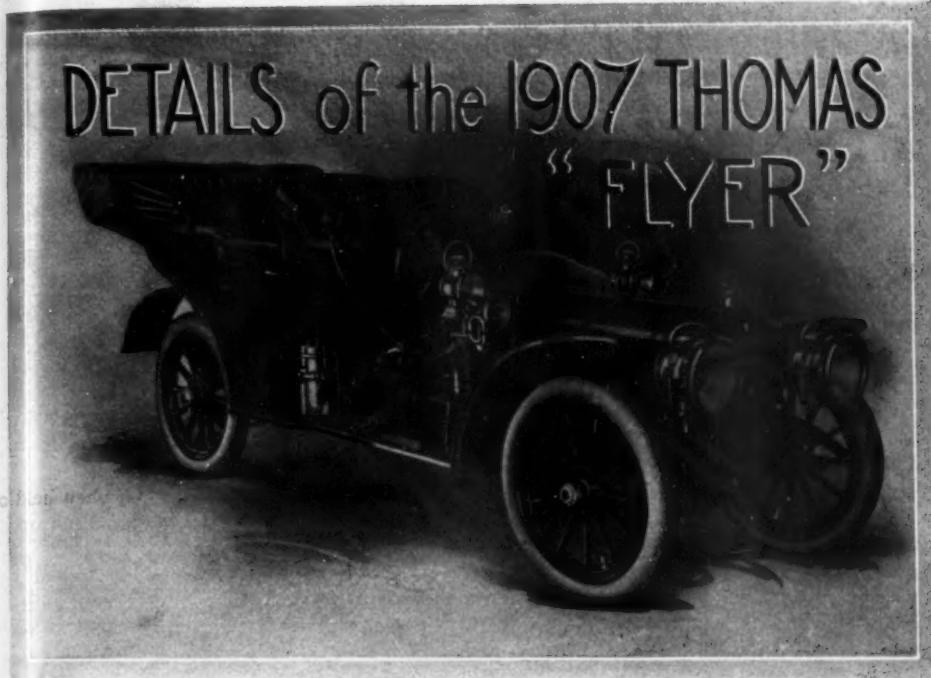
It is also proposed to prohibit any unlicensed person from driving an automobile unless a licensed chauffeur is on the same seat, ready to assist in any emergency that may arise. Reckless driving or violation of the law may be penalized by the guilty chauffeur losing his license, and in the case of an unlicensed person running an automobile, by fine and imprisonment.

LIBERALITY IN ENFORCING INDIANA LAW.

INDIANAPOLIS, IND., Nov. 12.—Secretary of State Fred A. Simms, who took his office April 1 of this year, submitted his first report on motor vehicle registrations this week. The report covered the time since the automobile law went into effect, April 1, 1905. The amount received for registrations since that time has been \$4,253. Of this amount, \$464.50 has been collected during the last quarter. Of an appropriation of \$1,200 for the expenses of the registration, Mr. Simms returned \$1,105.30 to the treasury.

While the report would show that few more than 4,000 automobiles are in operation in the state, it is believed that this does not represent the total number. In small towns and in the country districts there is little if any effort to enforce the state law. The majority of the registrations are from the larger cities where police authorities make an effort to enforce the law. There is not a single instance reported, however, where an arrest has been made for either failure to obtain or display the State numbers, which speaks well for Indiana autoists as a class.

English automobilists are agitated over a recent decision in a British divisional court that not only the driver of an automobile who exceeds the speed limit is guilty of an infraction of the law, but the other persons in the car, unless they can prove that they attempted to restrain the driver from exceeding the speed limit, are equally guilty on the ground of being aiders and abettors of a crime.



HOW THE 1907 THOMAS FLYER LOOKS, FULLY EQUIPPED FOR THE ROAD.

WHILE in general design the 1907 Thomas Flyer differs little from its predecessor, there have been many changes in the way of refinement, simplification, lightening, comfort, and appearance. With regard to the last item little need be said; the illustrations speak for themselves. The characteristic Thomas body lines have been changed but little, and are the same as in the 1906 model, except that they are slightly more convex. More room has been provided in the tonneau, and there are two revolving seats in addition to the great rear seat; the whole car, in fact, is more roomy than last year's model, and additional efforts have been made to insure the utmost comfort for the passengers. The increase of wheel diameter from 34 to 36 inches has an important effect on the riding qualities of the machine.

With a four-cylinder engine rated at 60-horsepower and a construction that has been lightened all round, yet made stronger through the use of improved methods of construction developed and tested in preparing for the Vanderbilt Cup race, and by the free adoption of the highest quality of material, the car has power that is ample for all emergencies. Separately cast cylinders, with integrally-formed water jackets, insure the easiest and quickest replacement in case of a damaged cylinder; valves are all mechanically operated, are placed on opposite sides of the cylinders and are identical in design and dimensions—interchangeable, in fact. They are larger than in any previous model, and are fitted with improved seatings for the springs so that the usual rectangular hole through the valve stem for the spring-retaining key is not needed. All the valve-operating mechanism—camshaft gears, camshafts, cams, journals, and push-rods—are inclosed in a casing which excludes dust and dirt, retains oil, and at the same time muffles the slight noises made by these parts, the motor being very quiet in operation. Nickel steel is used for the push-rods, which are hardened, ground to a finish, and fitted with adjusting nuts for regulating the lift of the valves.

Nickel steel drop forgings are used for the crankshaft and connecting rods. Bearing areas are very large throughout. The main crankshaft bearings are bolted to the aluminum crankcase by long bolts passing clear through and having their heads on top and the nuts underneath; the use of long bolts not only strengthens the whole structure, but avoids the danger of having the threads of studs work loose in the comparatively soft aluminum. Copper liners or shims are fitted to the bearings to give a quick and accurate adjustment for wear. The forward end of the

crankcase is a separate oil-tight compartment containing the gears through which the camshafts, the magneto and the circulating pump are driven; grease packed into the case insures efficient lubrication and reduces noise. A chain oiler is used on the rear journal of the crank-shaft.

Most important of the changes made in the motor is in the ignition apparatus. Two separate and distinct ignition systems are fitted, both being of the high-tension or jump-spark type, and each having its own set of spark plugs. In one system the current is generated by an imported Simms - Bosch high-tension magneto, and in the other a specially designed Atwater-Kent generator is used, this being mounted on the dash. Both sets of plugs are placed close to the inlet valves. The magneto is attached directly to the base of the engine on the inlet valve side.

Lubricating oil is sent to the engine by a six-feed mechanical oiler, four pumps feeding the four cylinders and the other two feeding the crankcase and the shaft-driven fan bearing. In the crankcase the splashing of the oil assists in its distribution to the various bearings.

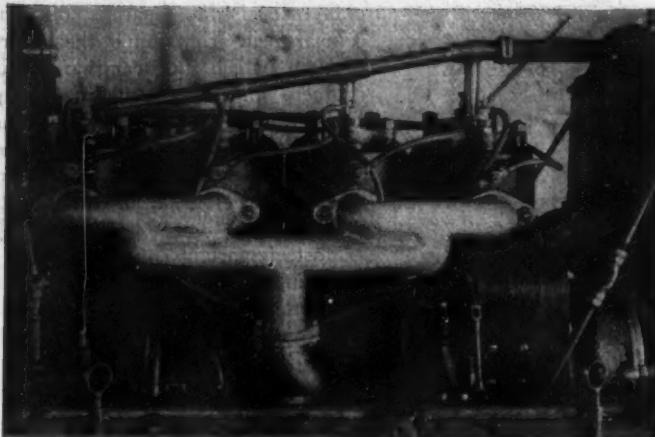
Cooling is effected by five gallons of water circulating through a specially designed Fedders honeycomb radiator. The arrangement of the piping is such that all the water can be drained out of the system from a single cock. Should any of the tubes of the radiator become damaged they can be removed and new ones inserted without the necessity for serious difficulty. The fan is driven by shaft and bevel gears, encased, and is fitted with a friction ratchet device which prevents damage in case of a back-fire in the motor.

Four forward speeds and reverse, with direct drive on the high speed, are provided for by the selective transmission; the gear-shafts are mounted on annular ball bearings with the exception of the forward end of the main shaft, which has a large roller bearing. Power is transmitted from the engine to the transmission through a three-disk clutch of the same general design as used in the 1906 car, two castiron disks on the engine shaft clamping between them a manganese bronze disk carried by the



FRONT VIEW SHOWING SHAFT DRIVE FAN.

The method of encasing gears is here shown, also cross frame member which serves as a radiator brace, and drop-forged I-beam front axle, with cross steering rod in rear.

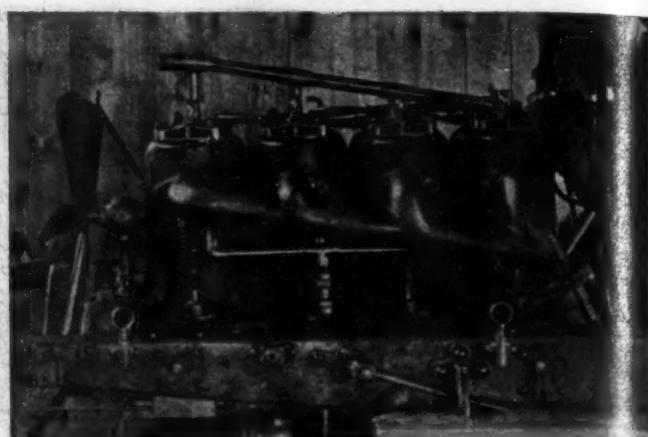


INLET SIDE OF MOTOR, SHOWING MAGNETO AND WIRING.

primary shaft of the transmission. The gearcase is suspended at three points, two in front and one at the rear; the differential casing is formed integral with the gearcase and is thus immovably aligned with it. Final drive is by side chains, the sprocket-shafts being mounted on annular ball bearings, as is also the differential gearing. Annular ball bearings are also used in the rear wheel hubs; the front wheels run on roller bearings, these having been selected because of their capacity for taking care of lateral thrust, which is apt to be heavy when the steering wheels are suddenly deflected, as in turning a sharp corner.

The cold-pressed channel steel main frames are narrowed at the front, and the motor is bolted direct to them. Where the bends occur the frames are strengthened by steel plates of the same thickness as the frames themselves, and further strength is imparted by four cross members—one at each end and two near the center, at opposite ends of the gearcase—and truss-rods on each side. Axles, both front and rear, are of drop-forged steel of I-beam section; the rear axle has been greatly improved and strengthened, experience having suggested improvements which have been incorporated in the new design.

One of the minor changes, and yet an important one, is in the braking system. Band-and-drum brakes on the jackshafts have replaced the internal expanding brakes on the rear hubs, and these are used for emergency application. The regular foot-brakes are external bands contracting on large drums on the rear hubs. Both brakes are larger than formerly. Within the hubs are placed ratchet-and-pawl stops, engaged by means of a small lever at the driver's hand, for preventing the car from running backward down grade. This arrangement is also very useful in starting a car up grade, avoiding the necessity for the expert brake



EXHAUST SIDE OF THOMAS FLYER MOTOR.

and clutch manipulation necessary to start a car when held on a grade by the brakes only.

Complete protection from flying dust and mud is assured by fitting the wide mud-guards with metal flaps and the front guards with aprons, filling the spaces between the guards and the car body. The mechanism is protected by a pan which extends from the bottom of the radiator to the gearcase, which not only prevents dirt and mud from flying up into the machinery from the road, but catches any drippings of oil and grease that may fall, and avoids the unsightly mess that is often seen in a place where a car has been standing for any length of time. Drippings from the carburetor are thus protected to a great extent from accidental ignition.

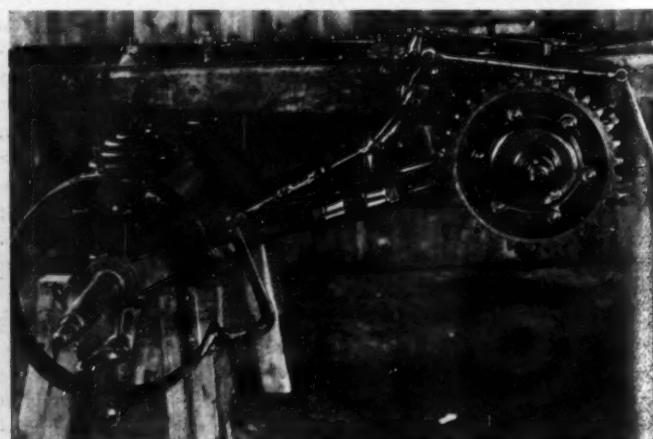
In addition to the twenty gallons of gasoline carried in the main tank under the driver's seat, two gallons are carried in a little emergency tank inside the main tank. The supply from this auxiliary container is independent of the main supply and the arrangement has the advantage of warning the driver when he has but two gallons of gasoline left, giving him a chance to make for a source of supply.

Steering gear is of the worm and sector type, mounted on ball and roller bearings; the cross-rod is placed behind the front axle, where it is protected from damage from collision. All springs are semi-elliptic. The radius rods are now of I-beam section and they transmit stresses between the centers of the sprocket hubs and rear hubs, not being offset from the hubs. The wheelbase is 118 1-2 inches and the tread 56 1-2 inches. Ample storage room is provided for tools, spares and personal effects—a familiar Thomas feature, and one that adds greatly to the value of the car for extended touring purposes.



VIEW OF THE THOMAS STEERING GEAR.

Illustration also shows the spark and throttle control at the base of the steering post.



BRAKES ON RIGHT HAND SIDE INSIDE SPROCKET.

Band brake on rear hub and the improved radius rod is also shown in the illustration.

HOW THE 1907 REOS WILL LOOK

SLIGHT changes in constructional details and in general outlines will make the 1907 Reo cars, manufactured by the Reo Motor Car Company, of Lansing, Mich., and handled by R. M. Owen & Co., of the same place, as exclusive sales agents, more comfortable, more powerful and efficient and stronger. The general mechanical features of the previous Reo models have been retained.

Carrying four passengers when the folding rear seat is raised and having the appearance of a regular two-passenger car when the rear seat is folded, the Reo runabout is a car that appeals to



FOUR-PASSENGER, 8-HORSEPOWER REO RUNABOUT FOR 1907.

a large class of users. Throughout the construction is as simple as possible. The single cylinder motor has a bore of 4 3-4 inches and a 6-inch stroke, and is rated at 8-horsepower, and drives through a two-speed and reverse planetary transmission, which has been so improved as to be noiseless in operation; final drive is by single chain to a sprocket on the live rear axle, the live shafts running on roller bearings. The front axle is of steel tubing and the front wheels also run on rollers. The framing is of angle steel and is carried on semi-elliptic springs in front and full elliptics in the rear. Brakes, which are double acting, act directly on the rear hubs. Steering gear is irreversible, of the worm and segment type. The car is controlled by a foot-operated throttle, a hand-operated spark lever mounted on the steering wheel, and the usual side lever controlling the speeds and the foot brake. A multiple disk clutch is fitted. Cooling is accomplished by water circulated by a gear-pump positively driven from the engine, the radiator being of the tubular type; the entire water system contains 2 1-2 gallons. Ignition is by jump spark, current being supplied by dry cells. The gasoline capacity is five gallons, and the car is stated to be capable of traveling from fifteen to twenty-five miles to a gallon, according to road conditions. The runabout weighs 1,000 pounds, has a wheelbase of 78 inches, and standard tread. Wheels are 28 inches in diameter, with 3-inch tires. The lamp equipment consists of two oil lamps for the front of the car and an oil tail light. Horn, tools, and tire-repair outfit complete the equipment. The price is \$675.

The Reo touring car is a larger machine throughout, being a regular light touring car

with double side entrance body. Under the body is the horizontal double opposed cylinder engine rated at 16 horsepower; as the car weighs 1,600 pounds, this gives a horsepower for every hundred pounds weight. In appearance the car has been improved over the 1906 model. The hood is longer and better shaped; the wheelbase has been increased 6 inches, and the chassis is 2 1-2 inches lower; there is more space between the dash and the front seat, and there is also more room in the tonneau. All these points not only improve the appearance of the machine, but they add in no small degree to the comfort of the occupants. The tonneau is now 2 inches wider than formerly, and gives 3 1-2 inches more leg room. This does not sound like a very important change, but in reality it makes considerable difference.

An improved design has been adopted for the live rear axle, and this includes a housing for the protection of the single driving chain and the sprocket. There are forty-two teeth in the rear sprocket and twelve in the front sprocket. Easy access has been provided for the purpose of lubricating the differential. In the engine the camshaft has been so arranged that it can be readily removed without disturbing any motor adjustments. An ingenious idea has been adopted for the protection of the motor and other mechanism. A fiber apron underneath excludes all dust and mud, and has the advantage of being free from metallic rattling and vibration, and is light and strong. The gasoline tank, placed

under the hood, carries twelve gallons—three gallons more than last year. The transmission, like that of the runabout, is of a silent design, giving two speeds forward and a reverse, all controlled by a single side lever. The irreversible steering gear is provided with means for taking up wear, so that the annoying back-lash that develops sooner or later can be got rid of.

The tonneau is detachable, and the full capacity is five passengers. The wheelbase is 90 inches—amply long for a car of this class—and the springs are semi-elliptic in front and full elliptic in the rear. The maximum speed is thirty-five miles an hour.

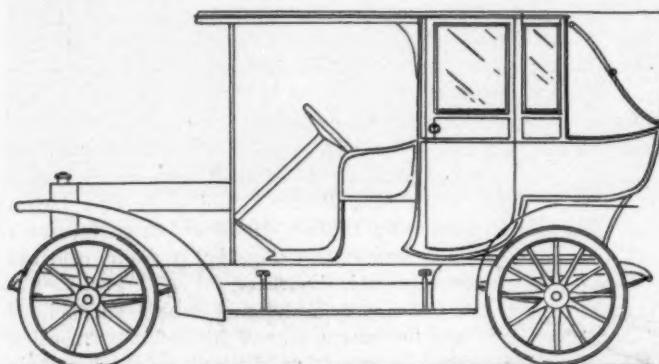
In addition to the usual tools and tire-repair outfit, the car is equipped with a set of acetylene gas lamps with separate generator and lens mirror reflector. The price of the machine is \$1,250.



FIVE-PASSENGER REO TOURING CAR WITH DETACHABLE TONNEAU.

A NEW AMERICAN DESIGNED LIMOUSINE.

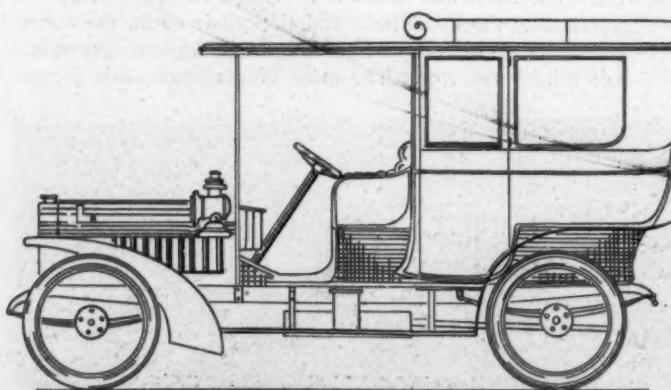
Appreciating that the automobile builder who aspires to build his cars throughout in his own factory must have a complete carriage building plant in addition to the metal-working plant for manufacturing the chassis, American builders are in many cases having the bodies for their cars built by specialists—carriage builders to whom automobile



LANDAULET BODY BUILT BY THE BABCOCK COMPANY.

body work is merely a new application of thoroughly well-known principles and practices. Thus the body building industry, as separate and distinct from chassis building, is assuming constantly increasing importance, and the very best of the American carriage builders are devoting serious attention to this very important branch. Among the prominent carriage builders who have recently taken up automobile body work is the H. H. Babcock Company, of Watertown, N. Y., two of whose designs, a full limousine and a landaulet, are shown herewith.

With the exception of the arrangement of the glass and the folding rear hood on the landaulet, the general specifications of both these bodies are the same. The length of the body, exclusive of the front seat, measuring from the front pillar to the rear of the top rail, is 60 inches, and from the pillar forward to the dash is 43 inches. The front seat is divided in the usual way, while the rear seat is continuous and will comfortably accommodate three persons; the side doors are each 22 inches wide. At its widest part the body measures 60 inches across, and where it rests on the chassis the width



FULL LIMOUSINE BODY, ANOTHER BABCOCK DESIGN.

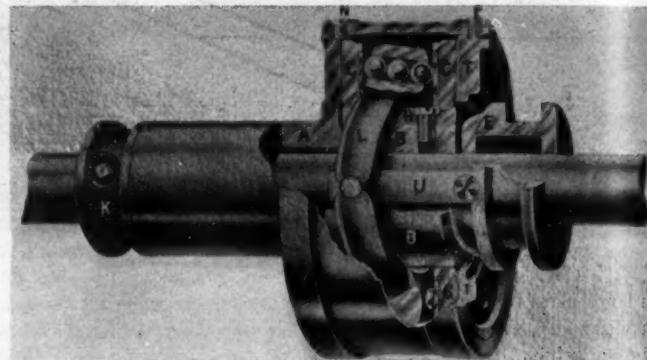
is 34 inches. White ash is used for all body framing and soft poplar for the paneling. Protection for the chauffeur is provided by a wind shield of glass and side curtains, completely inclosing the front seat when desired. All the glass work in the inclosed part of the body drops into pockets, leaving the car practically an open one. Window frames are trimmed inside to match the rest of the body work, and outside in mahogany. The purchaser may select cloth, leather

or morocco for the interior upholstering; toilet cases and a speaking tube to the chauffeur's ear are fitted regularly. Deep spring-backed upholstery makes the seats luxurious for the passengers, and the final touch of coziness is given by an electric dome light controlled by a switch within easy reach.

The H. H. Babcock Company was established in 1845 and has enjoyed over three score of years of continuous prosperous existence as a producer of high-class carriage work. The officers of the company are: President and treasurer, G. H. Babcock; vice-president, A. R. Flower; secretary, F. W. Babcock.

A COMPACT FRICTION CLUTCH.

In the accompanying illustration is shown a friction clutch, which, by reason of its compactness and powerful action, together with the ability to take up its load gradually and without shock, is said by the makers to be particularly suited to automobile work, though originally designed for use in connection with machine tools or line shafting. The clutch, called the Akron, is manufactured by the Akron Clutch Company, of Akron, O. Though to a novice the device may, in the illustration, look somewhat complex, it is really simple. It may be divided into three groups; the casing integral with the sleeve *A* and rotating always with the shaft; friction plates *C C*, rotating with the shaft



AKRON FRICTION CLUTCH FOR AUTOMOBILE SERVICE.

at the right, independent of the shaft at the left and of the casing, and the toggles *L L* and their actuating sleeve and collar *U* and *E*. The point where the shaft is divided is not indicated in the illustration.

Suppose the clutch is fitted to an automobile and that the engine is running and the clutch out of engagement. The shaft at the left will be the engine shaft, and with it will revolve the casing and sleeve *A*, while the plates *C C*, the toggles *L L* and other parts on the shaft at the right will remain stationary. If, however, sleeve *E* is drawn backward—to the right—by means of a fork or similar device of the usual type, the inner ends of levers *L L* will be drawn in the same direction and the rows of steel balls will be brought into a position parallel with the shaft, and in doing so will press the plates *C C* outward against the inner surfaces of the ends of the casing. The plates are fitted over keys on a sleeve *B*, and the sleeve, in turn, is fixed to the shaft. So when the plates or disks are pressed so tightly against the casing that no slipping can occur, the whole clutch rotates as a unit. It will be seen that the leverage of the toggles is very great and that the rolling contact of the balls avoids a great deal of the friction that would ensue were the balls not used. The disks are made heavy enough so that there will be no spring. Adjustment is easily and accurately effected by the end plate *T*, which may be screwed in by means of a special wrench that goes with each clutch. The screw *P* is slackened back until it is clear of the plate, and the plate turned by means of the wrench. There are recesses cut for the screw to enter, these being at regular intervals. Turning the plate from one recess to another represents an adjusting movement of one two-hundredth of an inch, so that accurate adjustment is readily made.

A SCOTCH AUTOMOBILE AMBULANCE

THE are many reasons why the silent, smooth-running automobile should be pressed into hospital service as an ambulance, for in critical cases a great deal may depend upon the patients being conveyed with as little disturbance as possible. In the ambulance here illustrated everything possible has been done to secure the utmost comfort for those who are compelled to ride in the vehicle. The motor is of an exceedingly quiet, smooth-running type, and the exhaust is thoroughly muffled; the springs of the car are of special design to absorb shocks to the utmost degree; resilient cushions intervene between the stretcher on which the patient lies and the floor of the car; and in cold weather the exhaust from the engine can be diverted into a heater in the car, warming the air to a degree that is easily regu-

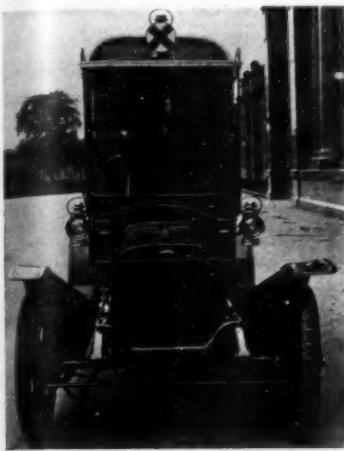
lated by a valve controlling the admission of the exhaust to the heater. The interior measurements are 8 feet length, 3 feet 10 inches width and 6 feet high. Electric lamps provide an abundance of light when required.

With regard to the mechanical features of the ambulance, there seems to be little that is novel, though the design is thoroughly up to date. A four-cylinder water-cooled Aster motor, rated at 26-30

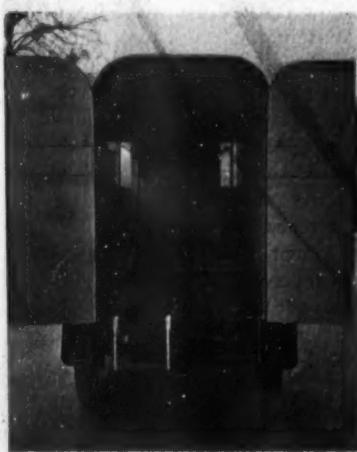
horsepower, is placed under the hood in the usual way; the cylinders have a bore of 4.9 inches and a stroke of 5.5 inches. Delays due to ignition troubles are guarded against by fitting two systems, both of the high-tension type, with a magneto as the source of current in one case and a storage battery in the other. Drive is through a multiple-disk clutch running in oil, a three-speed and reverse sliding-gear transmission and propeller shaft and bevel gears to the live rear axle. Forward of the inclosed body the car has the appearance of an ordinary touring car. An electric indicator is provided, by means of which the driver can be instructed from within the car without fuss or disturbance.

As the lettering on the vehicle indicates, the ambulance was built for the St. Andrew's Ambulance Association of Glasgow and was only recently completed, so that information as to its work in actual service is not yet available. The car was constructed by the Argyll Motor Company, of Alexandria, England, a concern well known on the other side of the Atlantic.

A great deal of interest is being taken in cars of this class and all experiments are closely watched. The horse will doubtless soon be a back number in ambulance service as well as other fields.



FRONT VIEW OF AMBULANCE.



REAR VIEW SHOWING INTERIOR.



THE AMBULANCE AUTOMOBILE RECENTLY PUT INTO EXPERIMENTAL SERVICE AT

GLASGOW, SCOTLAND.

CAN ONE DRIVE AN AUTO TO FLORIDA?

A PRELIMINARY SURVEY BY A. L. WESTGARD.

OWING to the interest aroused by the annual Florida beach races, the query has often been made, and of late with increasing frequency, if a trip from the Northern States to Florida is practicable with a touring car. In the absolute absence of any available data for this tour, because as far as known no automobilist has ever covered it in its entirety, anyone contemplating an attempt to become the pioneer of this route must necessarily form his plans and gather what advance information he can from a thorough study of the physical obstacles likely to be encountered.

An inspection of the United States topographical map will show that a direct route from Washington south and more or less following the Coast tier of counties through Virginia, the Carolinas and Georgia, is impossible, due to immense areas of low swamp lands and long sandy stretches, as well as to the frequent occurrence of wide rivers and inlets. However, a careful study of the topography and natural features would seem to indicate that a route farther inland ought to be feasible.

With New York for a starting point, the route would follow the beaten paths, so often covered by autoists, through Philadelphia, Reading, Harrisburg and Gettysburg, Pa., to Hagerstown, Md.; thence south past the Antietam battlefield, across the Potomac at Sharpsburg and down along the river to Harper's Ferry, Va. Here it enters the famous Shenandoah Valley, and follows it through Charlestown, Berryville, Winchester, Maurerville, New Market, Harrisonburg and Staunton to Lexington. So far, a distance of 476 miles from New York, the route has been over roads varying from good to excellent, most of the distance on macadam and pikes, with no bad hills. Below this point, on leaving the Shenandoah Valley, more difficult grades will be met, but it is not likely that any hills too steep for a high or medium powered car will be encountered.

The course from Lexington continues southwest, between the two mountain ranges, the Allegheny mountains on the west and the Blue Ridge on the east, through Roanoke, Salem, Pulaski, Wytheville, and Marion to Abingdon, close to the south line of Virginia, and across the state line to, or near to, Blountville, Tenn., whence the route would most probably follow the valley of the Holston river between Holston mountain and Clinch mountain to Morristown. From this point it would either con-

tinue in the same valley to Knoxville or cut across, south, to Danridge in the Tennessee river valley and follow same to Knoxville. It would now keep down the Tennessee river valley through Loudon, Kingston and Dayton to Chattanooga.

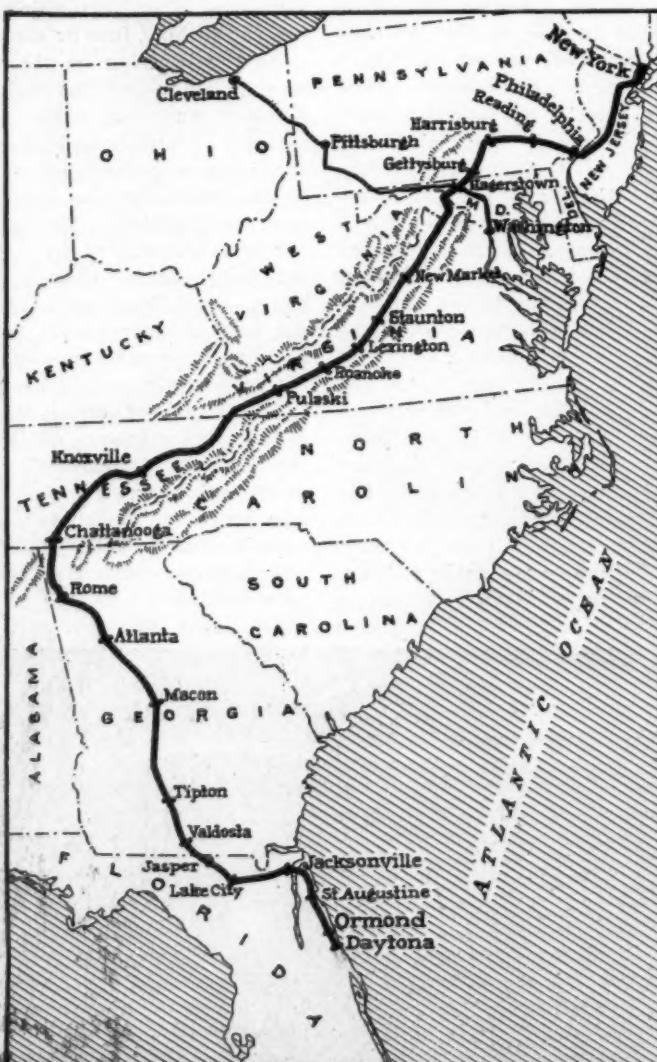
The scenery after leaving Harper's Ferry, and even for a considerable distance beyond Chattanooga, is most beautiful and extremely interesting. On leaving Chattanooga, Tenn., the course would be south along the line of the Central Railroad of Georgia

through Summerfield, Ga., to Rome. There is a strong probability of some rather rough going over this piece of the route. The route now veers more easterly through Cartersville to Marietta, and then again south along the line of the Southern Railroad, through Atlanta, McDonough and Jackson to Macon.

Up to this point the route has passed through larger cities and towns at rather convenient intervals, and it would seem that there were no very serious physical difficulties to bar the progress. It is believed that the greatest struggle of the entire trip still lies ahead of the pioneer enthusiast. The route now would undoubtedly follow the general course of the Georgia Southern and Florida railroad through Vienna and Tipton to Valdosta, Ga., and across the state line through Jasper, Fla., to Lake City, where it would bear east with the Seaboard Air Line along the southern edge of the immense Okefenokee swamp region through Macclenny to Jacksonville. The condition of the roads (and trails) after leaving Macon would probably be a serious problem, and road-mending tools might come in handy quite often; the character of the country and its inhabitants would undoubtedly present many difficulties.

The approximate distance to Jacksonville from New York along this route is 1,450 miles. It would be a legitimate claim to fame in the automobile world for someone to undertake and successfully accomplish this trip.

From Jacksonville south to Ormond and Daytona, the trip has been made by autos several times; the route leads across St. Johns river and east to Pablo beach on the Atlantic coast, thence down the beach to the inlet at St. Augustine, where there is a ferry. From St. Augustine south to Ormond the roads are poor, but passable, and from Ormond to Daytona is a good road on the mainland, and also the famous beach on which the races are run. The distance from Jacksonville to Ormond is about 90 miles, making the total distance from New York to Ormond 1,540 miles.



A natural Automobile route to Florida East Coast.

ROAD MILEAGE OF THE UNITED STATES

By ROBERT BRUCE.

THE total mileage of the public highways in this country has been the subject of frequent speculation among students of road questions. Of course no comprehensive or adequate data covering this matter are available, and will probably not be for a long time to come. However, the office of public roads, United States Department of Agriculture, Washington, D. C., has recently started work upon this important inquiry, and has already issued small leaflets covering briefly the information available for Alabama, Arizona, Arkansas, Iowa, Maine, Maryland, New Hampshire, North Carolina, Oregon, Tennessee, Virginia, and Washington. According to the estimates given in these reports, which are not formal, and are issued at irregular intervals—and date back principally to 1904—the approximate road mileage of the twelve States is as follows:

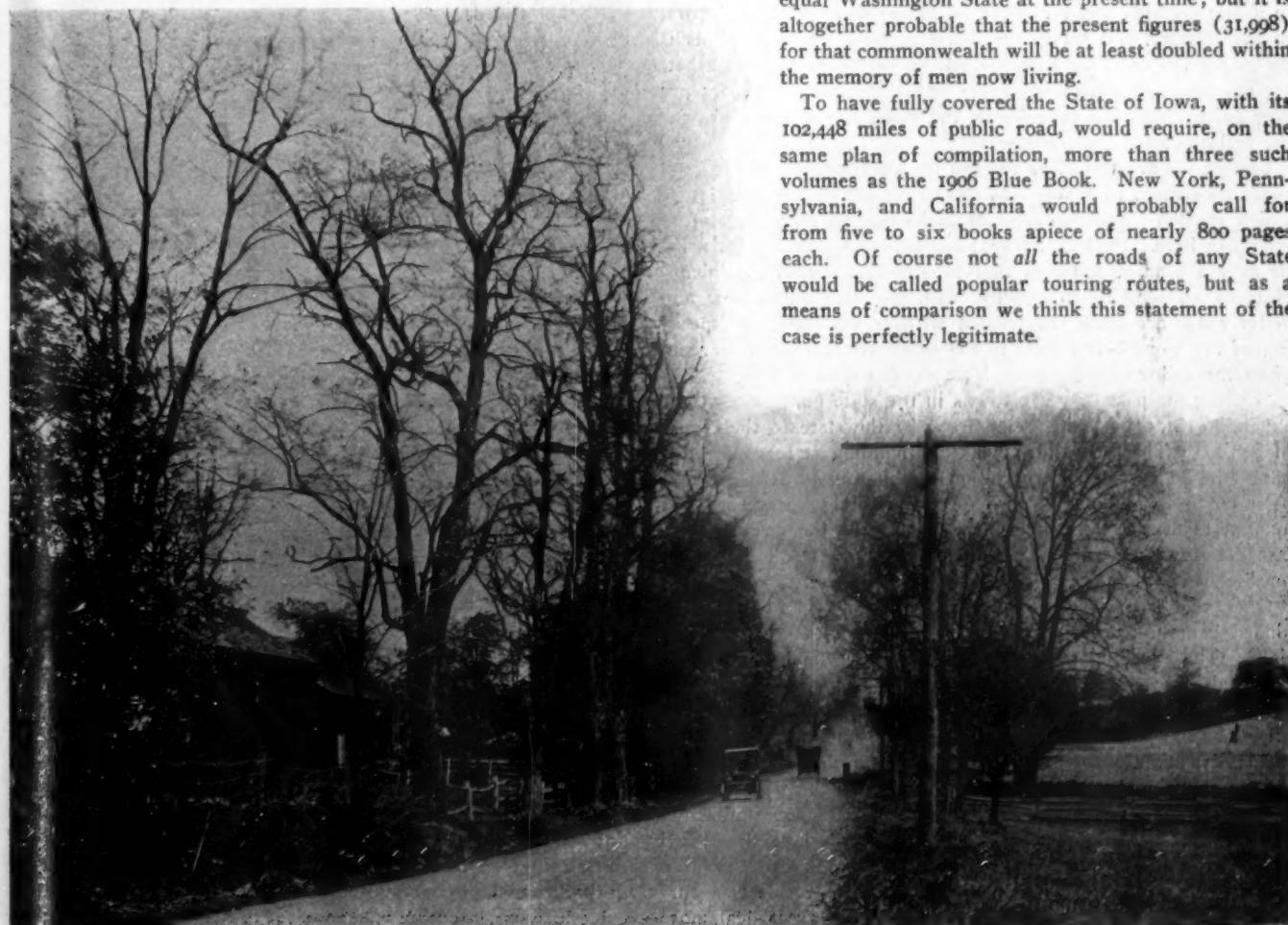
States.	Road Mileage.
Alabama	50,089
Arizona	5,987
Arkansas	36,445
Iowa	102,448
Maine	25,528
Maryland	16,773
New Hampshire	15,116
North Carolina	49,763
Oregon	34,258
Tennessee	48,989
Virginia	51,812
Washington	31,998
Total for 12 States	469,206 miles.

Naturally the estimates from the larger and most populous States are not yet available, and calculations of the whole from the basis of the figures already given is a very uncertain process. In all probability, New York, Pennsylvania, California, and Texas combined would equal the mileage of the twelve states, which total (roughly) 469,206 miles, or nearly a million miles for the sixteen states already mentioned. These figures would probably need to be multiplied at least by 3 to give the total mileage of the country, which would give a grand total of about 3,000,000 miles in Uncle Sam's broad domain.

A recent consular report calculates the corresponding mileage of Ontario, Canada, as 60,000, which is probably about one-third of the whole, considering the entire Dominion from Nova Scotia to British Columbia. Let us say, then, that there are in the neighborhood of 3,200,000 miles of public highway in this country and Canada. Beside this startling total—which is not believed by those who have studied the matter to be an excessive estimate—the approximately 225,000 miles of railroad within the same territory seems a very small thing indeed.

To look at it another way: *THE AUTOMOBILE* Official A. A. A. Blue Book, 1906 edition, covers in its text and maps a total of slightly more than 31,000 miles, made up of the best and most popular routes in the eastern and northern States, with a Canadian section. Its compilations enter sixteen States; and yet the total mileage covered in that volume would be less than the total mileage of either Alabama, Arkansas, North Carolina, Oregon, Tennessee, or Virginia alone. It would just about equal Washington State at the present time; but it is altogether probable that the present figures (31,998) for that commonwealth will be at least doubled within the memory of men now living.

To have fully covered the State of Iowa, with its 102,448 miles of public road, would require, on the same plan of compilation, more than three such volumes as the 1906 Blue Book. New York, Pennsylvania, and California would probably call for from five to six books apiece of nearly 800 pages each. Of course not *all* the roads of any State would be called popular touring routes, but as a means of comparison we think this statement of the case is perfectly legitimate.



A CHARACTERISTIC STRETCH OF IMPROVED AMERICAN HIGHWAY IN THE STATE OF NEW JERSEY.

Three things especially suggest themselves in this connection: (1) the need for the automobile as a means of shortening distances and time among our people, both in business and social life, and the opportunity to prove its worth beyond comparison with anything that has gone before; (2) the vast work ahead of the American nation in making these highways fit and economical for the larger use into which they are plainly coming; by the side of this work, all the time, money and labor spent on our 225,000 miles of railway will appear small; what will be done in this direction during the next quarter century will be in a sense a test of our national character and capacity; (3) the absolute infancy of road information in the United States.

It is when observed from standpoints like these that the usefulness and power for good of the automobile appears in its best aspects. In fact, it is almost impossible to think of carrying through the American road enterprises of the future without the assistance of the time and distance-saving automobile, and its younger but sturdy brother, the commercial vehicle.

HOW MAINE'S ROADS ARE BEING IMPROVED.

PORTLAND, ME., Nov. 12.—The State of Maine, long recognized as the playground of the nation, and now regarded as the best State in the Union for the enjoyment of automobiling, is undergoing a metamorphosis as far as the condition of its highways is concerned. This change for the better may and may not be the direct result of the growth of automobiling in the state, but it is thought that the increased number of machines owned in Maine, and the hundreds coming to the state in the summer time, have exerted their influence and the inhabitants of the towns and cities have at last awakened to the fact that Maine roads, which have long stood as a synonym for all that is bad in highways, must be improved. Up to a few years ago, except in a few sections, the highways of Maine were about the worst in the country, and surely the worst in New England. This is no longer the case, for with the advent of the automobile a better condition of affairs has come and thousands of dollars are now being expended annually by the state, towns and cities for the betterment of their highways.

One of the greatest steps toward the advancement of the good roads movement in Maine was the recent act of the Legislature which created a commissioner of highways, an office heretofore unknown here. Paul D. Sargent has held this position for a little over a year, and during that time he has stirred the inhabitants of all sections to activity, with the result that new and better roads are being constructed all over the state. In speaking of the work being done in the state, Commissioner Sargent gives the following figures to *THE AUTOMOBILE*:

"During the past year 270 towns in the state built state roads, expending \$105,000, being reimbursed by the state to the extent of \$48,000. This year 340 towns are building state roads, and have advised me that appropriations amounting to \$128,000 have been made for the work. I expect the total expenditure will amount to \$150,000, necessitating an outlay by the state of \$75,000. These figures will, I think, show the movement is a popular one."

One great cause of the bad roads in Maine is found in the almost general use of narrow-tired wheels in the country sections. These cut up the highways into ruts, which make them well-nigh impassable in wet weather, and especially in the spring, when the frost is coming out of the ground. Many selectmen of country towns have tried, and generally in vain, to secure the adoption of broad tires by the farmers. To prove to the farmers that broad tires were beneficial to the users as well as to the roads, the selectmen of the town of Rockport, in Knox county, purchased four sets of wide-tired wheels and induced the proprietors of a lime kiln that used four-horse teams to place them on their wagons as an experiment. The result was surprising to the teamsters, who found they do a great deal more hauling with less work, and the roads were smoothed out to a degree that was highly satisfactory. The town sold the wheels

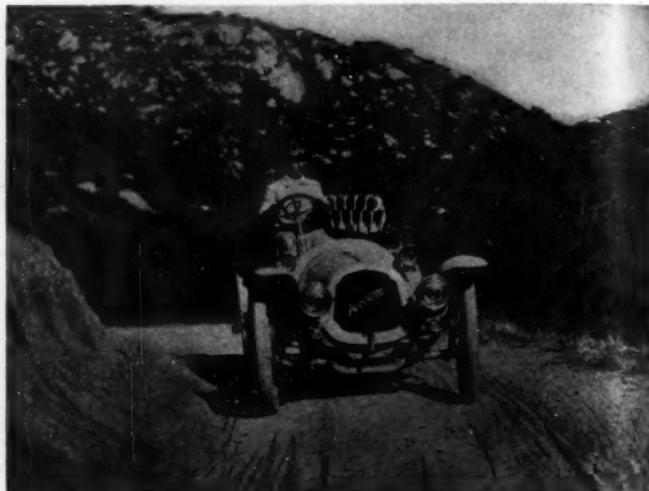
to the lime burning company for what they cost and saved practically all the money that had heretofore been expended yearly for the repair on that particular stretch of road.

While the automobilists of Maine are doing no united work in Maine to further the good roads cause, they are, individually, doing all in their power. Maine has become such a rendezvous for the tourist automobile that the more done for the betterment of the highways, the greater will the revenue be that the state will derive. Citizens and officials realize this, and it is safe to predict that when the hundreds of New York and Boston automobilists visit the state of Maine in 1907 they will find better roads than have ever before existed.

CALIFORNIA'S DELIGHTFUL TOURING.

F. M. Hoblitt, of the Aerocar Company, Detroit, Mich., is one who recently experienced the delights of California touring, driving from Los Angeles to San Diego, with the return trip by way of Riverside and Redlands.

"This trip," states Mr. Hoblitt, "beat anything that my wildest dreams had ever fancied. The roads, a good portion of the way, were very fine. We sped along at thirty-five miles per hour very



ON THE PALO GRADE IN SOUTHERN CALIFORNIA.

easily, and in one place we found stretches where fifty miles an hour was safe and easy riding. Again we found miles and miles of road that made me long for the old corduroy roads of Indiana.

"We left Los Angeles at 11 p. m., driving all night so as to go over the mountains in the early morning hours. By so doing I believe that one is afforded one of the most picturesque trips that can be found in this country. Fifteen to twenty miles up hill, then fifteen to twenty miles down. It requires a firm clutch and a good set of brakes, as the test is a severe one.

"In going over the Palo Grade, a traveler winds in here and out there, up this incline and down that, around one mountain and then another, through an ever-changing panorama of wondrous beauty and marvelous delight. First you are in nooks and crannies, and then on a shelf cut in the rocks. It is up, up, up one side, and down, down on the other. Many times the road is so narrow that there are only occasional spots where teams can pass. It was all new to me, and you can readily imagine the thrills that filled me, as our little Aerocar sped along as if it, too, shared the delight of that glorious ride.

"The pleasure of the trip was not marred by a single instance of tire trouble, and, with the exception of oiling our engine, we did not touch it from the time we left until we again returned to Los Angeles. If a party of two were to make a few such tours in this wonderful country in the ordinary way it would cost them enough to buy a touring runabout. It is well known by those who have attempted to take some of these side trips what a tremendous amount it costs in the regular ways."

INDOOR SEASON FOR THE CLUBS DRAWS NEAR

Washington Autoists Have a Quinn to Deal With.

WASHINGTON, D. C., Nov. 12.—Members of the Automobile Club of Washington were very much in evidence at the recent meeting of the Town Council of Glen Echo, Md., held to hear the charges preferred against J. W. Collins, the Town Marshal, by Col. M. A. Winter, a member of the club. Collins was charged with conduct unbecoming an officer and was severely arraigned by Colonel Winter and a dozen other witnesses, who testified with great unanimity of the outrages they had suffered at his hands. Colonel Winter was represented by W. S. Duvall, President of the Automobile Club of Washington, and of the Automobilists' Protective Association; Creed M. Fulton, and A. E. Leckie, and they apparently made out a clear case against Collins. The Town Council listened to the most damaging testimony for over three hours, and the weak defense made in Collins' behalf seemed to indicate that he would suffer the loss of his office. To the surprise of everyone the Town Council brought in a verdict acquitting him.

Mayor Garrett then called up the charge against Colonel Winter for violating the speed law, and imposed a fine of \$50 and costs. An appeal was noted and the question will now be determined by the circuit court of Montgomery county.

In imposing the \$50 fine on Colonel Winter, Mayor Garrett took occasion to make this remarkable statement: "I understand that the Automobilists' Protective Association has been formed; that a large sum of money has been subscribed for the employment of legal talent, and that a fight will be made against the laws of Glen Echo. I want to say that Glen Echo is going to fight, too. The vast majority of automobilists who come out on the Conduit road from Washington are a gang of toughs and hoodlums, who violate our laws and who are responsible for the maintenance of gambling joints and speak-easies in Montgomery county. Let it be understood that henceforth any automobilist who may be brought before me for violating any of the laws of this municipality will be fined \$50 and costs, the maximum fine that I can impose."

A madder lot of automobilists than those of Washington when they heard of this outburst of the "boy mayor" could not be found in a week's travel. The case has been appealed.

Annual Banquet and Election of the Chicago A. C.

CHICAGO, Nov. 12.—Gathered together around the festive board at the Auditorium Hotel, whereon was spread the annual banquet of the Chicago Automobile Club, were automobilists of all kinds, including the members of the high-speed brigade. And it is on record that a large number of the speed lovers hastily thrust their hands into their pockets and felt for their wads, instinctively, as Justice J. F. Boyer, of Evanston, Ill., who was one of the invited guests, and who has fined about three hundred automobilists for speeding, rose to his feet with dignity and glanced around the board. He met the glances of a number of men who had appeared before him in court; but the mild words of His Honor soon restored the equanimity of the startled ones.

"Gentlemen," he said, "I don't exactly know why you should call me your friend. I appreciate the honor you have paid me, however, and I may say that I count among my most loyal friends members of the Chicago Automobile Club. At first I declined the invitation to this banquet; but the reply came that I was a humorist, so here I am. I would like to say to you, confidentially, that I don't think it is quite fair for you men to ask your wives or daughters, sitting in the back seats of your cars, to swear that a speed indicator that they could not possibly see was registering exactly eight miles an hour at the instant the policeman stopped the car. Don't ask your wives and daughters to do things you would be ashamed to do yourselves."

President Simmons, of the Lincoln Park Board, stated his belief that 98 per cent. of automobilists obeyed the spirit of the speed ordinances, only 2 per cent. being confirmed speeders. He appreciated the fact that automobilists have rights and that pedestrians have also, and reminded his hearers that if a man chose to take his five children, his wife and his grandmother to the park and march them across the road in single file, he had a right to do so, and the automobilist must check his speed and not try to shove in between and break up the family.

Other speakers were Justice Asa C. Adams, who besought



HOW A WAG ASTONISHED A COUPLE OF INNOCENT AUTOISTS BY CHANGING A FIGURE ONE INTO A FIGURE FOUR.

the automobilists to break the speed ordinances freely, as the days of the justice are limited and the city in need of funds; Mayor David H. Jackson, of Lake Forest, who said the automobilists were good sportsmen; John Farson, who expressed the opinion that convict labor should be employed to improve the country roads; Mayor John T. Barker, of Evanston; Frank H. Pietsch; Charles E. Cox, architect of the new clubhouse; and Ira M. Cobe, the new president of the club.

At the annual meeting which preceded the banquet the following board of officers was chosen for the ensuing year: President, Ira M. Cobe; first vice-president, F. H. Pietsch; second vice-president, Harry J. Powers; secretary, Sidney S. Gorham; treasurer, T. J. Hyman; directors, John Farson, S. K. Martin, Jr., Charles E. Gregory, J. F. Gunther, B. H. Marshall, L. E. Meyers.

Cleveland Automobile Club May Have Home of Its Own.

CLEVELAND, O., Nov. 12.—Members of the Cleveland Automobile Club are discussing the feasibility of inaugurating an active campaign for increasing the membership of the organization, with the ultimate object of building a clubhouse with a garage capacity of accommodating the cars of a majority of the members. It is proposed to bring the matter formally before the next meeting of the club, which will be held the latter part of the present month. A number of the younger members, to whom the social possibilities of such a movement strongly appeals, are advocating it. By increasing the membership of the club to 1,000, purchasing a site, and bonding it, the members subscribing for the bonds, it is believed the project could be carried out successfully.

The board of trustees of the Cleveland Automobile Club will meet in the near future to perfect arrangements for monthly meetings this winter. Instead of ordinary routine business meetings, these gatherings will be enlivened by the reading of a paper or an informal address on subjects relative to the operation or maintenance of automobiles, and then the topics will be discussed in the open meeting. While the Cleveland club is rated as one of the most progressive organizations in the country, the idea is to awaken new interest and get the members together as often as possible to their mutual advantage. Secretary Asa Goddard is preparing programs for several meetings, and he will arrange to have the club addressed by some very prominent experts in various branches of the trade.

Customs Regulations for Canadian Auto Tourists.

MONTREAL, CAN., Nov. 12.—Having taken up the question of the method of procedure necessary for automobile tourists from Canada to enter the United States, the Automobile Club of Canada has received from the Collector of Customs at Plattsburgh, N. Y., an official circular specifically setting forth the United States Treasury Department regulations covering the matter. The circular states that an automobile entered for touring purposes by a non-resident may be permitted to pass to and fro between Canada and the United States, provided that a certificate showing the entry of the automobile, to be issued by the Collector of Customs at the port of entry, be presented to the proper customs officer at the frontier upon the occasion of each entry and departure, for indorsement by such customs officer of each entry and departure thereon, and that such certificate be finally surrendered to the Collector of Customs at the port of entry not more than three months after the date of the original entry.

G. Lewis Mayer Awarded the Brazier Cross-Country Cup.

PHILADELPHIA, Nov. 12.—The runs and tours committee of the Automobile Club of Philadelphia has awarded the Brazier Cup for the recent cross-country run over the Doylestown-Quakertown-Pottstown-Philadelphia course to G. Lewis Mayer, who, besides bringing his Thomas car to the finish

in the lead, fulfilled all the conditions as to observance of speed regulations throughout the run. On Friday evening next, at the clubhouse, at 1405 Walnut street, the first smoker of the season will be held. Each club member is privileged to bring with him an "unattached" automobilist, and, besides the usual features of such symposiums, Albert L. Cleugh will deliver a lecture on "Ignition." As an expert Mr. Cleugh is well qualified to make plain to the tyros the technicalities of his subject, and a big attendance is assured.

Activity of the New York Motor Club.

NEW YORK, Nov. 13.—At to-day's meeting of the Board of Directors of the New York Motor Club fourteen active and nine non-resident members were admitted to membership. During the Grand Central Palace show the clubrooms will be open to visitors, and guests' tickets will be supplied upon application to members. A big smoker will be held Sunday evening, December 2, plans for which are now being made and will call for something out of the ordinary.

The annual meeting of the club will be held Saturday evening, December 13. The nominating committee, appointed last week to prepare lists of officers for election at the meeting, consists of Harry Unwin, T. F. Moore, F. C. McAllister, Nathan Lazarnick and D. F. Graham. The tickets will be announced twenty days previous to the date of the meeting.

St. Louis Autoists Want New Law in Missouri.

ST. LOUIS, Mo., Nov. 10.—At the last meeting of the St. Louis Automobile Club a bill was drafted to be presented to the next session of the Missouri legislature, providing for the repeal of the law of 1903 governing automobiles, and the substitution of the new measure. The proposed measure makes the speed limit 25 miles an hour in the country districts, 15 miles an hour in the cities and towns where the streets are not congested with travel, and for one license which will be good all through the state. Under present conditions an automobilist must obtain a license from each county in which he operates his car.

CLUB DOINGS IN GENERAL.

SAN ANTONIO, TEX.—The automobilists of this city have effected permanent organization under the name of the San Antonio Automobile Club with the following board of executive officers: President, G. D. Robbins; vice-president, G. A. C. Haiff; secretary, Dr. G. H. Fairfield; treasurer, H. F. Cook. The club starts with a charter membership of eleven.

BOSTON, MASS.—The Woodland Park Hotel, the summer home of the Bay State Automobile Association at Auburndale, Mass., was destroyed by fire October 30. Fortunately the association had removed most of its effects to the Boston clubhouse for the winter season a few days previous to the fire, and in consequence was not a material loser by the conflagration.

WILKINSBURG, PA.—Twenty-one automobilists of this place have permanently organized the Wilkinsburg Automobile Club with Dr. W. R. Stephens as president and Dr. W. C. Cook as secretary and treasurer. During the past summer many pleasant runs have been held by the members. The culmination of these runs was the organization of the club on October 25.

NEW YORK.—The annual dinner of the Motor Boat Club of America will be held at the Hotel Astor, this city, November 24. Sir Thomas Lipton, Rear Admiral Joseph B. Coghlan, Cornelius Vanderbilt, Frederick G. Bourne, and others prominent in matters nautical, are among the invited guests. The annual meeting of the club for the election of officers will be held at the Hotel Manhattan, Wednesday evening, November 21.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

Dec. 1-8.....—Seventh Annual Automobile Show of the Automobile Club of America, Grand Central Palace, New York City, under the patronage of the American Motor Car Manufacturers' Association.

Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.

Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.

Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Association. E. E. McMasters, manager.

Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building, Buffalo.

March 9-16.....—Boston Automobile Show, Mechanics Hall and Horticultural Hall, Boston, Automobile Dealers' Association. Chester L. Campbell, manager, 5 Park Square, Boston.

April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.

Tours.

Nov. 14-15-16...—Annual Economy Test of the New York Motor Club. Entries can be made at the club's new headquarters, Seventh Avenue and Fifty-eighth Street, New York City.

Race Meets and Hill Climbs.

Nov. 29.....—Riverside, Cal., Thanksgiving Day Hill Climb, Box Springs Grade Hills.

Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

FOREIGN.

Shows.

Nov. 15-24.....—London, Olympia Motor Show.

Nov. 23-Dec. 1...—London, Stanley Show, Agricultural Hall.

Dec. 7-23.....—Paris, Ninth Annual Salon d'Automobiles, Grand Palais.

Dec. 15.....—Calcutta, India, Exhibition of Automobiles, etc., Automobile Association of Bengal.

Feb. 1-9.....—London, Crystal Palace Motor Show.

March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.

April 6-13.....—London, Agricultural Hall Motor Show.

Reliability Runs, Race Meets, Hill Climbs, etc.

Nov. 12-17.....—Australian Reliability Trials.

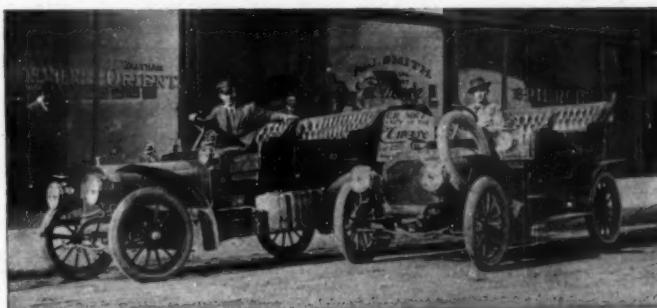
Nov. 19-Dec. 5...—Paris-Marseilles and return Reliability Run for Touring Cars (Concurrent run for Military Supply Wagons under patronage of French Ministry of War).

Dec. 1.....—La Coupe de Salon Motor Boat Race.

May 29-June 1...—Irish Automobile Club Reliability Trials.

BRAZIL ASKED TO CONTROL RUBBER.

The Brazilian coffee "valorization" scheme has been followed by the introduction into the Brazilian Congress of a similar project in regard to rubber. The rubber producers make the same claim to consideration that was made by the coffee producers, but whether or not they will meet with like success is not yet possible to say. According to the proposal all rubber which is not to be consumed in the factories in Brazil is to be deposited by the producing states at the docks which lie within the zone of collection, and penalties are provided for cases of noncompliance. The rubber is to be paid for at the government bureau at the daily price on presentation. The right of exportation will be reserved to the rubber-producing states and will be carried out in their behalf by the fiscal delegations. The government is authorized to take up a home or foreign loan of not more than \$50,000,000 with which to look after the rubber.



SEIGERT AND BRAY STARTING FOR TONAPAH IN THEIR ELMORES.

A RECORD FROM LOS ANGELES TO TONAPAH.

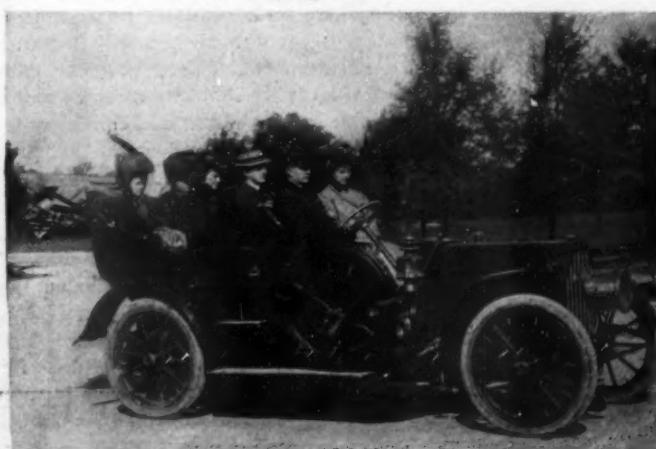
LOS ANGELES, CAL., Nov. 9.—Fred Seigert recently made a trip from Los Angeles to Tonapah in a three-cylinder Elmore in thirty-six hours. The distance is 300 miles, and under ordinary conditions such a run would not be worthy of notice; but when it is considered that Seigert drove his car through stretches of sand for miles and miles and over mountain grades, the like of which few autoists ever see, the performance is a notable one. He went through some sections which had never seen an automobile before, and many ranchers told him he was the first to successfully negotiate a number of sandbeds.

At Tonapah, Seigert did such good work in reaching new mining camps by crossing desert country through which there was not even a road that he sold his car for \$300 more than he paid for it. Returning to Los Angeles he purchased a couple of four-cylinder cars, and the photo shows Seigert and R. R. Bray just before starting for the mining camp. Bray had just taken the Elmore agency for San Francisco, and drove the car to Nevada for the experience.

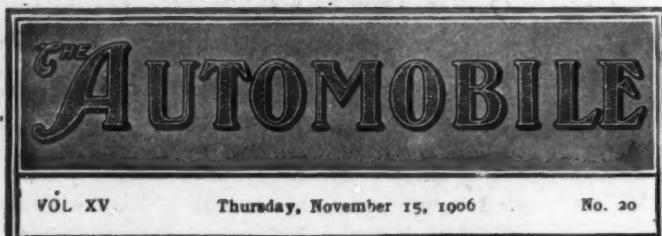
WILL BE FOUR 1907 MONARCH MODELS.

CHICAGO, Nov. 12.—The Monarch Motor Car Company has just been incorporated with a capital stock of \$150,000. A number of prominent Chicagoans are at the head of the new concern, of which Patrick M. Hanney, president of the Hazel Pure Food Company, is chairman of the board of directors. The new company has a factory at Franklin Park, Cook county, and has a force of sixty men who can turn out five cars a day. T. A. Quilan, Jr., president and general manager and J. A. Ward, secretary and treasurer, have charge of the executive department of the company.

The 1907 models will be in four styles—a runabout, stanhope, Queen Victoria, and light delivery wagon. Although the factory has been running but a short time, orders are coming in from such distant places as Russia, Mexico, and Canada.



H. H. LYCLE DEMONSTRATING 50-HORSEPOWER POPE-TOLEDO.



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Definition of a "Freak" in Automobile Racing. What is a "freak" in racing, is not as easy a question to answer as would first appear. The present rules, both in this country and abroad, conclude practically after requiring a few essentials, such as four wheels, two brakes, and a motor-driven reverse, and limiting the weight to 2,204 pounds. Originally it was held that a racing car should be so constructed that without any material changes it could be converted into a vehicle that would be available for ordinary uses. It is true that even the fastest craft ever built might be utilized in a limited way, but only by skillful drivers, and then on roads where traffic was not congested. In great degree this explanation is far-fetched, and will find little consideration. Thereupon the exponent of these powerful monsters will reply that all parts of a car are subjected to an enormous strain, thereby betraying weak points and thus helping in the building of a staunch vehicle for the general public.

It was E. T. Birdsall's recommendation—and others argued in a similar strain—stated several years ago, that the classification of racing cars should be by total piston displacement, together with a fixed minimum weight; and Mr. Birdsall holds that there certainly would not be any worse types than we have now. Whether this commonsense proposition will ever be brought about before racing has lost its worth from the standpoint of the manufacturer—and when it does, there will be no more racing—is extremely doubtful, and it would seem that the racing authorities will have to meet the emergency with an effort to equalize matters as far as lies within their power.

To meet the issue of the present moment squarely and without any evasion, the whole subject concerns the Florida meet of

January next. There is a solitary steam car which unquestionably more completely belongs in the freak class than does any one of the gasoline cars, several of which, however, might be somewhat amenable under a strict interpretation of Rule 45 of the A. A. A. Racing Rules, which reads as follows: "The referee shall have absolute power to prohibit any car which he considers unsafe, unsuitable, or of improper construction to start in any event."

The Florida program, as at present outlined, provides stock car events from which any so-called freaks are positively barred; the gasoline free-for-all brigade has a mile limited to their own kind, and they also have several long-distance events which will be the features of this year's meet. In the mile free-for-all the "teakettle" will have the advantage; at two miles gasoline last year defeated steam; and above this distance the percentage is in favor of gasoline as the mileage increases. The general public incidentally wants to know what kind of an automobile can travel the fastest mile, but it is more vitally interested in learning what car can survive the long distances and thus prove unquestionable reliability and endurance coupled with speed, which alone and in a mere dash is an asset of doubtful value. In track racing this year the 50 and 100-mile events have eclipsed in interest the sprints, and the same proposition will hold good in the Florida meet.

American Road Mileage in Large Figures.

The article in THE AUTOMOBILE for November 1 entitled "The Field for the Automobile" has not only been the subject of considerable general comment, but it has brought out the article published in this issue relative to the total road mileage of the United States and Canada. Mr. Lougheed shows by figures appearing in the Eleventh Census that there is an annual production of over a million and a half horse-drawn vehicles in this country every year—an average of one to every fifty-three of our total population. Mr. Bruce, basing his calculations upon the figures already compiled for twelve states by the Department of Road Inquiry at Washington, concludes that there are 3,200,000 miles of common highway in the United States and Canada.

Both of these communications are highly interesting from the sheer magnitude of the two widely different subjects with which they deal. Up to this time the production of automobiles—wonderful as it is, especially considering the short time involved—makes a very small numerical showing as compared with the production of horse-drawn vehicles. Gradually, of course, this disparity will be lessened; and yet it is safe to say that an equality in numbers between them may be brought about within the memory of living men. Overproduction of automobiles manufactured with strict regard to the needs of the American people seems a possibility only of the far-distant future.

That there are over three million miles of highway in this country and Canada is an equally startling fact. It means, for one thing, at least fifteen miles of common road to each mile of railway in our national domain. Only an infinitesimal proportion of this vast total is as yet improved, according to the modern practice, or is fit for the economical passage of farming, business, or pleasure vehicles. To remedy this condition is a task beyond comparison with any other that can be named. The progress of automobiling is closely bound up in the progress of this work; suitable roads multiply the automobile's opportunity.

Is the Problem of Air Navigation Solved?

Apparently on the verge of solving the problem of air navigation is M. Santos-Dumont, the energetic Brazilian, who has devoted himself to the task with most commendable persistence. He has gone about his work in a quiet, unassuming manner, has predicted little of what he would do, but has been content to demonstrate convincingly each step as he has approached it. Recent cables from Paris tell reassuring news, and it would seem that man had nearly won another great triumph. Here's to the plucky Brazilian who sails aloft under the colors of the Aero Club of America.

THE ANNUAL ELECTION OF THE A. L. A. M.

At its New York City headquarters, No. 7 East Forty-second street, the Association of Licensed Automobile Manufacturers held its annual meeting and election November 7. Charles Clifton was re-elected to the presidency, the complete list herewith following:

President, Charles Clifton, George N. Pierce Company.
 Vice-President, Thomas Henderson, Winton Motor Car Company.
 Treasurer, H. H. Franklin, H. H. Franklin Mfg. Co.
 Secretary, L. H. Kittridge, Peerless Motor Car Co.
 Executive Committee—F. L. Smith, Olds Motor Works; S. T. Davis, Jr., Locomobile Company of America; M. J. Budlong, Electric Vehicle Company; Wm. E. Metzger, Cadillac Motor Car Co.; E. H. Cutler, Knox Automobile Company.

The plans of the Show Committee of the Seventh National Exhibition, to be held in Madison Square Garden January 12 to 15 next, were approved. The association intends to make the show the most notable affair of the kind ever held in this country. The decorations will be on a grand scale.

PRESIDENT VANDERBILT, OF MOTOR HIGHWAY.

At the recent meeting of the organizers of the Long Island Motor Highway, held at Lawyers' Club, New York City, W. K. Vanderbilt, Jr., was elected president; Harry Payne Whitney, first vice-president; and Jefferson De Mont Thompson, treasurer. No second vice-president was selected, for the reason that this official will be the general manager, and in the naming of the secretary he will be consulted. The executive committee will consist of the president, first and second vice-presidents, treasurer and three directors, the directors chosen being Commodore Frederick G. Bourne, Colgate Hoyt and Ralph Peters. Gratifying progress is being made in the matter of stock subscriptions, E. R. Thomas, the Buffalo manufacturer, being one of the recent subscribers to the amount of \$25,000. It is understood that the entire highway can be completed inside of eight months, this being the statement of railroad men competent to pass upon the situation.

CORBIN JOINS THE LICENSED ASSOCIATION.

The Corbin Motor Vehicle Corporation, New Britain, Conn., has been admitted to membership in the Association of Licensed Automobile Manufacturers, the action having been taken at the November 7 session, though the announcement was withheld until after the papers had been signed and the license granted. This action on the part of the A. L. A. M. indicates that it intends to pursue its policy of admitting new members whenever the applicants qualify to certain standards which have previously governed. The stock of the Corbin company is owned by the American Hardware Company, one of the largest corporations in the country.

NEW YORK MOTOR CLUB ECONOMY RUN.

The three-day economy run of the New York Motor Club started Wednesday morning from the club headquarters, Eighth avenue and Fifty-eighth street, New York City, with eight contestants: Simplex, Panhard, Reo, Frayer-Miller, Compound, Premier, Wayne and Dorris. The first day's run was to Albany; the second day to Springfield, Mass., and the third day will be occupied in the return to New York City, a total of 430 miles.

NO CUBAN RACE MEET NEXT WINTER.

HAVANA, CUBA, Nov. 12.—Because of the unsettled state of the country, the Havana Automobile Club has decided not to have any automobile races next winter. According to Ramon Mendoza, \$3,000 was subscribed for last winter's meet and only \$300 was actually paid in.

AN ECHO OF THE SEARCHMONT PERIOD.

PHILADELPHIA, Nov. 12.—The local automobile world was startled last week when, during the Federal Court hearing of the suit of the Trust Company of America against Barclay H. Warburton, to recover \$15,000 and interest unpaid for bonds in the defunct Searchmont Automobile Company, the defendant's counsel answered that he had been induced by false pretenses to lend his name to the concern, and that it had been understood that said bonds were to cost him nothing, his connection with the company being designed to bring in other moneyed men of Philadelphia and New York.

Mr. Warburton had been elected and had acted as treasurer of the company, and, so say his attorneys, actual money or its equivalent was a scarce commodity in the affairs of the company. They instance a bit of paper calling for \$350,000 and signed by Spencer, Trask & Co., of New York, which was paid into the Searchmont treasury and which was almost entirely offset the same day by Searchmont's checks to them for an equal amount. This to make it appear, they claim, that the firm mentioned was interested to that amount.

The plaintiff's contention that Warburton, in the Searchmont bankruptcy proceedings, had testified that the company was "on the level," despite the boosting of its capital from \$75,000 to \$2,000,000 with little to show for the latter dropsical figure, is met by the defendant with the statement that at that time he believed what he testified to. He says his eyes are opened now. He will fight the effort to make him pay for his stock bonus to the last ditch.

TRADE NEWS FROM CLEVELAND.

CLEVELAND, Nov. 12.—The Peerless Motor Car Company is among those which have secured so much business for next season that additions are necessary. Two large new buildings are now under construction, and, when completed, the plant will be one of the largest in Cleveland, a city noted for its large manufacturing establishments.

The White Sewing Machine Company is busily engaged in removing its machinery from its old factory to the mammoth new plant on St. Clair street, now nearly completed. The new establishment, when fully equipped, will be one of the largest in the world. The White people have been experimenting for some time with a heavy steam truck, and just now it is coming in very handy in moving machinery.

The Monarch Motor Car Company, a newcomer in the Cleveland field, has opened offices at 1201 Citizens' Building. The concern is headed by Irwin G. Guthrie, Bernard Guthrie and W. D. Droum. It will market three models next season, a 30-35-horsepower, a 45-horsepower and a 125-horsepower racer. The racer follows closely the big machine designed by W. D. Droum for the Gates Mills hill climbing contest this year.

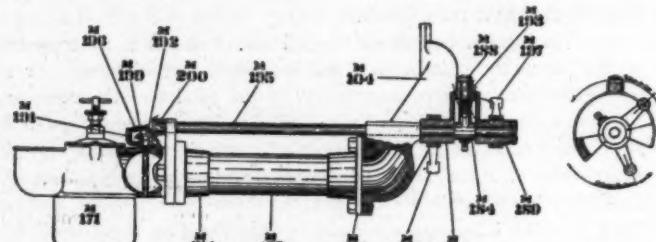
MINNESOTA CAR WITH HIGH ROAD CLEARANCE.

MINNEAPOLIS, MINN., Nov. 12.—The H. E. Wilcox Motor Car Company, Eleventh avenue and Marshall street, has been incorporated with a capital of \$100,000 by H. E. Wilcox, John F. Wilcox, R. D. Wilcox and Maurice Wolfe, who also are the officers of the company. Fifty cars will be built at once of the four-cylinder air-cooled type, and fifty more will comprise the output for the first season. A distinctive feature will be the excessive road clearance of the car—16 inches—the roads of the Northwest demanding same in the opinion of the manufacturers.

H. E. Wilcox, president of the company, is an automobilist of seven years' experience, having covered in a car in various trips the states of Minnesota, Illinois, Iowa, Wisconsin and the Dakotas, and is thoroughly familiar with the road conditions in this section. Full details of the car, which will be called the Wolfe after its designer, Maurice Wolfe, will be published in the near future.

THE WINTON PRECISION THROTTLE.

On the Winton Model M for 1907 a throttle is placed between the carbureter and the cylinders to regulate the mixture volume entering the cylinders, the device being known as the Winton Precision throttle, and for which patents have been applied by the Winton Motor Carriage Company, of Cleveland, Ohio. By referring to the detail drawing below it will be seen that but one throttle valve is used, the same being operated by either hand or foot independently, and the movement of either, it is stated, will



■ DIAGRAM SHOWING DETAILS OF WINTON PRECISION THROTTLE

produce instantaneous acceleration, without any backlash whatever, independent of what the previous position of the other might have been.

By referring to the constructional drawing the throttle valve will be noticed in the carburetor casting. It consists of a disc fixed upon a stem, and on this stem is a small bevel gear which meshes with the small bevel gear (199), which meshes with the corresponding bevel gear (200), which is pinned to the throttle shaft (195). At the right end of this throttle shaft there are two bevel gear segments (190 and 189), which revolve loosely upon the throttle shaft, but are held, as shown, from longitudinal motion. Upon each of these gear segments is placed an arm (197). One of these connects to the foot button, and the other to the lever on the steering column, so that a motion of the foot button, or of the steering column lever, produces the corresponding motion to the foot button gear segment and the hand lever gear segment. Between these gear segments on the throttle shaft is fixed a hub (184), which carries at its extremity a bevel pinion (193), which meshes with the two bevel gear segments. These three bevel gears act exactly as does the differential gear.

Assume that the gear segment (189) is given a partial rotation. If the gear segment (190) is not connected to any fixed part it will be rotated in an opposite direction to the motion given 189. The pinion in this case will revolve upon its bearing, but giving no motion to the hub (184). Now, if the same rotation be given the gear segment (189), and the gear segment (190) be held and prevented from rotating, the bevel pinion (193), being made to rotate upon its own axis, and at the same time meshing with the stationary gear (190), the hub upon which the pinion rotates will be given a rotation in the same direction as that given the gear segment (189), but its angular movement will be one-half of that given it by the segment. Conversely, if the segment (190) is given a rotary motion, and the segment (189) held stationary, the pinion will then rotate, using 189 as the fixed gear, and produce the motion of the throttle. That is, if either of the bevel gears is restrained from motion and motion be given to the other gear, the pinion will have a motion in the same direction as that transmitted to the gear which is moved. This pinion being attached to the hub (184), and the hub being fixed upon the throttle shaft (195); the same motion is transmitted to the disc throttle valve.

Assume the hand lever on the wheel to be opened one-fourth; the foot button, being held up by a spring, does not permit the other bevel segment to rotate, and the spring pawl on the hand lever holds the bevel gear to which it is connected from rotating. Now, if the foot button be slightly depressed, an instantaneous movement will be given to the bevel pinion, as in this case the other segment is prevented from rotating by the spring pawl on

the steering wheel lever. Thus, it will be seen that no matter what the position of the foot or hand lever may be, the slightest motion of either, using the other as a fixed point, produces instantaneous and precise motion of the throttle.

The Winton Type X-I-V motor possesses the variable lift inlet valve, operated by the well-known Winton air control, which regulates the volume of the charge.

WHERE MR. SELDEN'S ANCESTORS ARE BURIED

HARTFORD, CONN., Nov. 12.—As George B. Selden has bought some property adjoining the cemetery in Hadlyme, where his ancestors are buried, and has made arrangements to have the burial ground protected, it is not expected that he will come here as often in the future. Mr. Selden was considerably worked up over the Hadlyme cemetery, and some of his criticisms, which were printed in *THE AUTOMOBILE*, stirred up a hornet's nest among some of the older residents down there. He placed the matter in the hands of Francis H. Parker, the United States District Attorney, and the latter smoothed everything out and bought what land was necessary. Mr. Selden will probably soon erect monuments over the graves of the Seldens. His first ancestor in this country helped to found the Hartford Colony with the Rev. Thomas Hooker.

BUSY TIMES AT THE G & J FACTORY.

INDIANAPOLIS, IND., Nov. 12.—The G & J Tire Company are working day and night to keep up with its orders. The company is greatly increasing its factory facilities, having about completed an additional story to one of the buildings.

The Oval Raised Tread Automobile Tire placed on the market by this company for 1906 has proven so successful that the coming season bids fair to be even busier, but with increased facilities the company expects to be able to handle all orders promptly.

THE SKIDDING BRIGADE OF AUTOTOWN

DETROIT, MICH., Nov. 12.—There are in Detroit an aggregation of drivers who have most road race drivers "backed off the boards" when it comes to premeditated corner skidding. They are the testers of the Packard Motor Car Company. Their



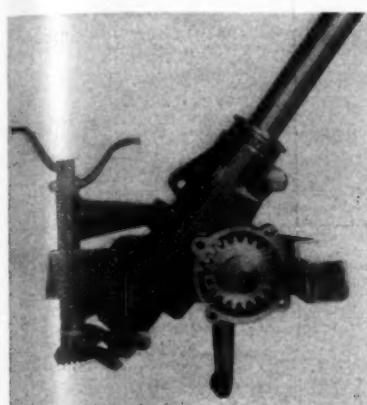
TRYING OUT A PACKARD ON A SANDY CORNER ON VINCENT ROAD

Stamping ground is Vincent road, and it is religion with them never to round a corner in safe, graceful style when there is a possible chance to run up to it straight, put on the brakes, swing the rear end around and dash ahead in the new direction. There is also purpose in their seeming skid-madness. Such sidewise sliding will bring out evidence of any rear-axle misadjustment if such exists. The accompanying photograph presents William Birmingham, head of the testing department, in a characteristic skid on a sandy corner.

A DESCRIPTION OF THE MODEL D AEROCAR

THERE is, perhaps, no class of car that offers greater attractions to the average purchaser than the light touring car with power that, while moderate and requiring no great quantity of fuel, is high in proportion to the weight of the car. A well-built car of this type will do almost anything that can be done by a pleasure car, short of attaining extreme speed or carrying a large number of passengers, and it has the further advantage of being inexpensive to maintain, because of its moderate size and modest requirements, and, what is of extreme importance, is easy on tires, owing to its lightness. All this being granted, it is not surprising that there is a very positive demand for such machines, largely among men who anticipate driving and caring for their own cars and do not care to be overburdened with work in consequence.

It is a car of this class that the Aerocar Company, of Detroit, Mich., has brought out in its



WORM AND NUT STEERING GEAR.

new Model D for 1907, a 2,000 pound \$2,000 car with a four-cylinder air-cooled motor rated at 20 horsepower, carrying five passengers; fitted with three-speed sliding-gear transmission, with direct drive on the high speed, and driving through universally jointed propeller shaft and bevel gears to the live rear axle.

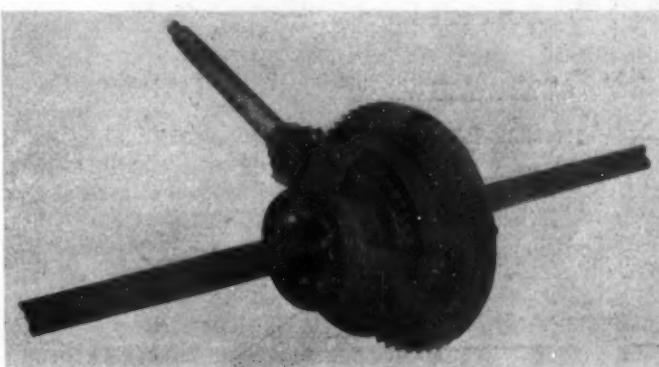
The four vertical cylinders of the motor are cast separately, as is usual with air-cooled cylinders, and integrally with them are cast wide, thin radiating flanges, twenty-one to each cylinder, giving a total radiating surface of 1,155 square inches for the four cylinders. Bore and stroke are each 4 inches and the cylinder walls and piston surfaces are ground and polished to a mirror finish. Four rings are fitted, placed three above and one below the piston pin; the pistons are grooved to catch and distribute the lubricating oil. All the reciprocating parts are weighed and made to balance exactly so that vibration from unequal weight in these parts is avoided and the motor runs with maximum smoothness.

Air is blown back against the cylinders by a 15-inch fan running on Hess-Bright ball bearings and driven by a belt from the crankshaft. The form of the fan is such that the current of air thrown back by the outer ends of the six brass blades converges toward the rear cylinders, with the result that the two rear cylinders are quite as effectually cooled as the front ones, notwithstanding their apparently sheltered location.

All the valves are of the mechanically operated type and open through the cylinder heads, being actuated by rocker arms which, in turn, are moved by long push-rods extending upward from the single camshaft which operates all the valves. Wide steel rollers take the thrust of the

cams and minimize wear; the gears driving the camshaft are housed in an oil-tight casing. The camshaft may be removed without disturbing other parts or altering any adjustments.

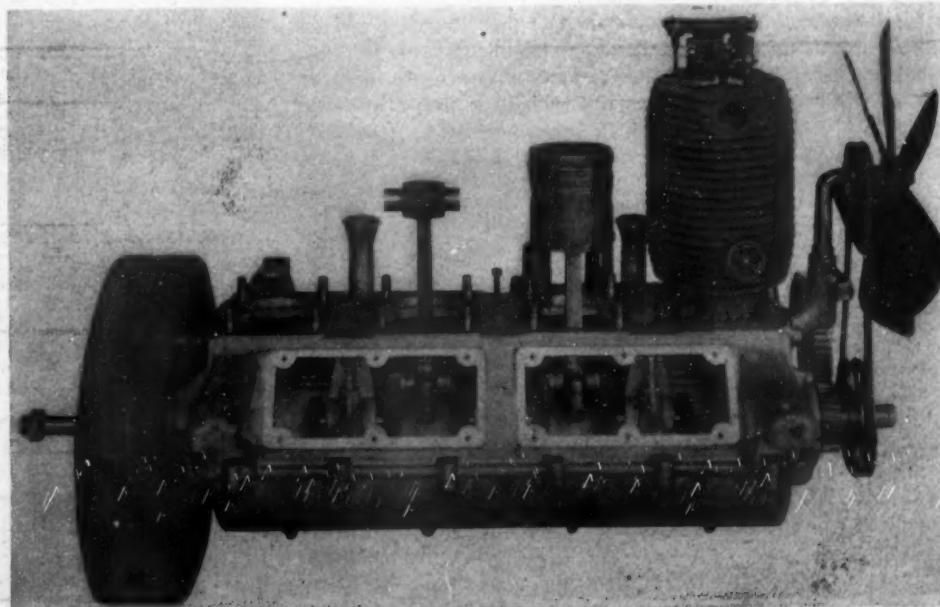
The crankshaft is made from a one-piece hammered-steel forging and is finished with the greatest possible accuracy. Running in five bearings, it is well supported. Lubrication is by splash in the crankcase, oil being fed to each cylinder by a mechanical oiler and dropping to the crankcase, which is made with partitions dividing it into four sections, one for each crank. This insures the equal distribution of oil, regardless of the angle at which the car is running or standing. The crankcase is divided horizontally, but access may be had to the cranks and connecting rods without removing the lower half, there being two openings



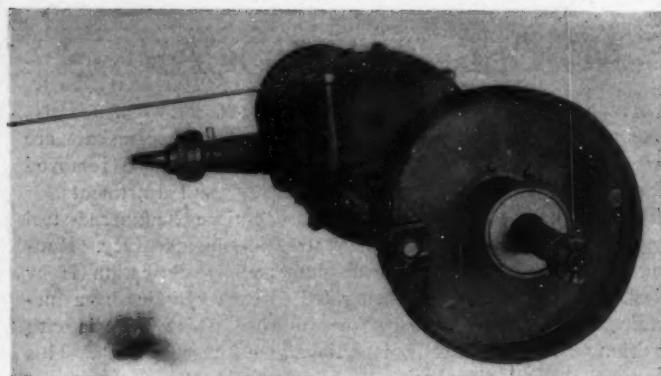
BEVEL GEAR AND DIFFERENTIAL WITH LARGE BALL BEARINGS.

on the right-hand side, 3 1/2 inches wide and 9 1/2 inches long, covered with plates held by thumbscrews. Four petcocks in the bottom of the four compartments make it easy to drain off old oil or get rid of kerosene used for flushing out the cylinders.

Ignition is by jump spark, the plug being placed where the sparking points are directly in the path of the incoming cool charges of gas. A six-volt storage battery is the regular source of ignition current, while a set of dry cells is installed as an auxiliary and is mounted on the subframe. The roller-contact timer, with hardened tool steel roll, is carried by a vertical shaft



AEROCAR 20-HORSEPOWER, AIR-COOLED MOTOR, PARTLY ASSEMBLED.



INTERNAL EXPANDING BRAKE, THAT HOLDS IN EITHER DIRECTION.

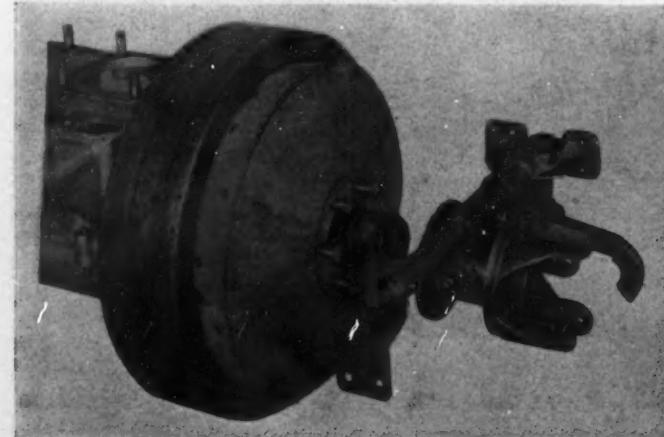
bevel-gear driven from the camshaft and is very easily reached. On the dash is the quad coil in a mahogany case, and the spark lever is on the steering wheel column, where it can be manipulated with one finger.

Carbureter troubles due to variations in the height of gasoline in the spraying nozzle are guarded against by placing the mixing chamber and, of course, the nozzle in the center of the float chamber. An automatic compensating air valve is fitted. The carbureter is placed on the left side of the motor; gasoline is fed to the carbureter from a 17-gallon tank placed under the driver's seat, and in the tank are four transverse partitions to prevent the swashing of the gasoline when the car is running over rough roads. The exhaust from the engine is carried to a muffler which the manufacturers state to be practically noiseless.

The clutch is a light aluminum casting with leather facing and is mounted on two annular ball bearings. The pedal by which it is manipulated is intended for the driver's left foot and can be adjusted to the most comfortable position for the individual who uses the car.

In the usual location is the three-speed and reverse sliding gear transmission inclosed in a dust and oil-tight aluminum casing, its shafts made from a special quality of nickel steel, and running on roller bearings. Grease is used as a lubricant in the gearcase, and this is inserted through two hand-holes provided for the purpose in the top of the casing. Thus, it is unnecessary to remove the top half of the casing for putting grease in, though this can be done if necessary.

Heavy universal joints of hardened steel are fitted to the steel propeller shaft, and these are encased and packed in grease, which can be renewed when necessary. The short shaft carrying the bevel driving pinion runs on American ball bearings, and is inclosed in a housing, which also contains the differential and the bevel driving gear. Both bevels have planed teeth and are hardened. When the car is normally loaded the propeller shaft is practically in a straight line with the transmission shaft and the bevel pinion shaft, so that the universal joints have only to



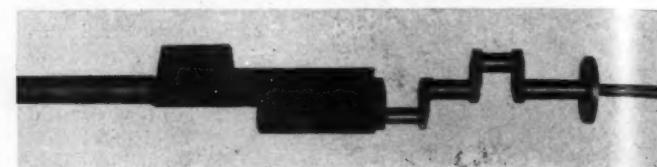
LEATHER-FACED CLUTCH SHOWING SPRING AND BALL BEARING.

compensate for the slight angles caused by the up-and-down motion of the body on its springs.

Pressed steel of the usual channel section is employed for both main and subframes, the intersections being stiffened by heavy gusset plates. The main members are of 4 inches maximum depth and have 1 1-2-inch flanges. The motor and change-speed gearbox are supported by subframes.

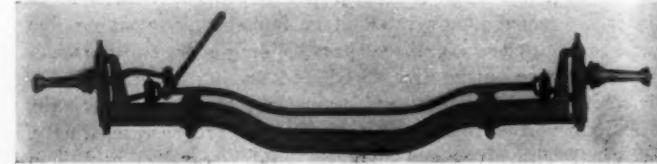
All springs are semi-elliptics, with 8 leaves. Front spring are 41 inches long and the rear springs 48 inches long. The front springs are directly under the main frames, secured by the usual eyes at the front, and double shackles at the rear ends. The rear springs have brackets at their front ends and double shackles at the rear and are outside the frame line, giving ample freedom of action.

Steel tubing is used for the rear axle proper, while the driving



PARTLY FINISHED AEROCAR CRANKSHAFT, SHOWING FORGING.

shafts, of special steel, run in two-point ball bearings, ground true in position. Hubs, brake drums, brake disks and pinion housings are made of drawn sheet steel. The front axle is also of steel tubing and is 2 1-2 inches in diameter with the heavy forged steel steering knuckles secured to the ends. The pivots turn on ball bearings. The upper jaw of the fork rises above the axle, and, in addition, the axle itself is dropped in the middle,



SEAMLESS STEEL TUBE FRONT AXLE, WITH DROPPED CENTER.

giving the car a low hang, which the manufacturers state to be beneficial, both on account of the stability afforded and the ease of riding given. The cross-rod connecting the steering knuckles is protected by its position back of the axle, and is bent to the same conformation. The hickory wheels have twelve spokes each and are regularly fitted with standard clincher rims for 32-inch tires.



REAR AXLE SHOWING DUST AND OIL TIGHT HOUSINGS.

A substantially built steering gear of the worm and nut type is inclosed in a tight casing and equipped with ball thrust bearings. The action is quick and easy, and a short turning radius is permitted. The spark and throttle levers are independent of the movements of the wheel.

On the right hand side of the car is the emergency brake lever and the speed lever, and on the floor the pedals for the clutch and working brake. The emergency brakes in the hubs are of the internal expanding ring type, of large diameter, and are faced with camel's hair lining; equalizers distribute braking stresses.

The bonnet or hood is of cold-rolled sheet steel and is fastened in its place by devices that do not permit rattling. The steel mud-guards have inside aprons to protect the body of the car. Mahogany is used for the straight dashboard, and the edges are heavily brass-bound.

FIRST AID TO THE PUNCTURED TIRE.

To provide first aid for the punctured tire was the object of G. H. Treadgold, of Port Huron, Mich., in designing the ingenious emergency wheel illustrated herewith. The wheel is made in two halves, as shown, for convenience in carrying and attaching. It has a hub 17 which slips over the ordinary wheel hub and is cushioned inside to prevent marring the finished hub. When the two halves are brought together four dowel pins, 5, 6, 13 and 13, enter corresponding holes and align the two halves, while the bolts 9 and 10, on which are right and left-hand threads, are screwed up, drawing the halves together and holding them hard against each other. Four straps, two of which are shown at 14 and 15, hold the emergency wheel in place on the regular wheel. When the automobilist who carries one of these wheels finds that he has a punctured tire, he does not stop by the wayside to go through the distasteful job of removing and repairing the inner tube, but takes one-half of his emergency wheel and slips it in place on the regular wheel over the deflated tire and straps it securely. The first half is placed over the part of the wheel that is uppermost. Then the car is shoved forward until



METHOD OF APPLICATION OF TREADGOLD EMERGENCY WHEEL

the section of the emergency wheel takes the weight off the tire and acts as a jack, supporting the car by the hub of the wheel. Then the second half is put in place; it is this stage of the proceeding that is shown in the illustration. The dowels are properly entered, the right and left-hand bolts screwed home, making the wheel a unit, and the straps are put on the second half as they were on the first. The car can then be driven to the nearest garage or other place where it is convenient to have the tire properly repaired, and the necessity for driving on the flat tire and perhaps destroying it is avoided.

The inventor states that tests on both large and small cars have proved the wheel to be amply strong and to do what it was designed for. Patents are pending.

The firm of Schwender, Day & Co., of Mankato, Minn., which has for nearly a year conducted a garage, has been dissolved and reorganized under the name of Schwender Bros. The same business will be conducted, the only difference in the firm being the retirement of a former member.

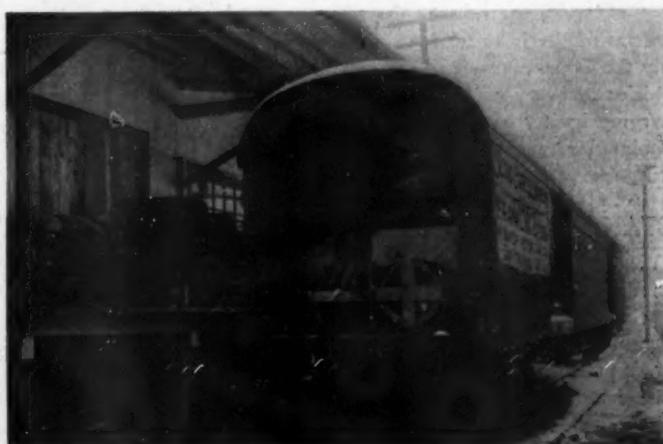


VICE-PRESIDENT WRIGHT AT WHEEL OF MODEL H KNOX

AN AIR-COOLED NON-STOP RUN.

Long trips over ordinary roads, made without stopping the motor, are popular as tests of cars, especially new models; and the builders of air-cooled cars now take a special delight in proving the reliability of their cars in general and the efficiency of the cooling system in particular, in this way. An interesting run of more than five hundred miles—to be precise, 503 miles—was recently made by the new Model H Knox four-cylinder air-cooled car for 1907, rated at 25-30 horsepower and weighing 2,250 pounds complete.

Driven by William E. Wright, vice-president of the Knox Automobile Company, and carrying its full complement of five passengers, the car started from the factory at Springfield, Mass., half an hour after noon on Thursday, November 1, and ran through Hartford, Meriden, New Haven and Bridgeport to New York, arriving at 5.50 P. M., the running time being 5 hours 20 minutes. Refreshments for man and motor were disposed of in twenty minutes, the clutch was again let in and the run to Springfield made in 6 hours 5 minutes, the times made between the various towns corresponding very closely with the clocking on the first trip, darkness being responsible for the slight variations that occurred. Again leaving Springfield, and passing through Palmer and Worcester, Boston was reached at 4.01 o'clock in the morning after 3 hours' 22 minutes' driving without a stop of any kind. The Hub must have looked very cold and uninviting at that hour, for after a stop of nine minutes the last stage, from Boston back to Springfield, was commenced and, after 3 hours 54 minutes, finished, and the motor was stopped for the first time at the factory after arriving at 8.04 A. M., Friday. There were no involuntary stops of any kind. The total elapsed time was 19 hours 34 minutes and the total running time 18 hours 41 minutes.



EXPRESSING FRANKLINS BY CARLOAD TO SAN FRANCISCO

A HANDY WAY TO SEE BEHIND YOU.

As nature unfortunately failed to provide man with eyes in the back of his head, and as man, at least of the automobiling type, finds that he needs them badly, the Mirroscope Company, of 40 West Sixty-second street, New York, has stepped into the breach with the device illustrated here. The occupants of a car can see what is coming up on them from behind without twisting around



MIRROSCOPE IN POSITION ON DASH OF CAR.

and losing sight of what is getting into the way in front, and as long as the driver does not get mixed up as to which is the front and which is the back, he is safe all around. The mirroscope needs no extended description. It consists of a mirror in a substantial frame, carried by a bracket attached to any suitable part of the car, as shown. It is particularly suitable for limousines and other types of closed body cars, in which it is difficult to get a view to the rear.

ONE HUNDRED DOLLARS FOR A NAME.

A new concern, the Barnard-Briggs Motor Car Manufacturing Company, of 27 State street, Boston, announces that it will build for the season of 1907 a complete line of both pleasure and commercial vehicles ranging in price from \$1,000 to \$4,000. A leading model will be a 30-horsepower four-cylinder car at \$2,500. The company is looking for a name for its cars, and offers to give a prize of \$100 to the person who suggests the most suitable name for the machines—a name that will not apply to any other make of car. Here's a chance for some bright one to make an easy hundred.

PHILADELPHIA HAS NEW ELECTRIC GARAGE.

Another addition to Philadelphia's automobile facilities, the completion of which was announced last week, is the new electric vehicle department of the Quaker City Automobile Company. There will be facilities for the simultaneous charging of forty vehicles, while the repair department will be able to take care of vehicles of the heaviest type. While the company's line includes only the Pope-Waverly, it has facilities for taking care of electric vehicles of every conceivable make. A specialty will be made of charging igniter batteries quickly. Underwood Cochran has been appointed manager of the sales force.

STANDARD ROLLER BEARING CO. ENLARGES.

Vice-president and General Manager Samuel S. Eveland, of the Standard Roller Bearing Company, of Philadelphia, has purchased for that company the entire plant and real estate of the Pennsylvania Iron Works Company, which adjoins the Standard company's present property at Forty-eighth street and Girard avenue. Five factory buildings are thus secured with a total of over 100,000 square feet of floor space, which is being equipped with \$200,000 worth of new machinery. The Standard company is also erecting a five-story concrete addition to its plant, 100x210 feet.

A COLUMBIA GASOLINE-ELECTRIC.

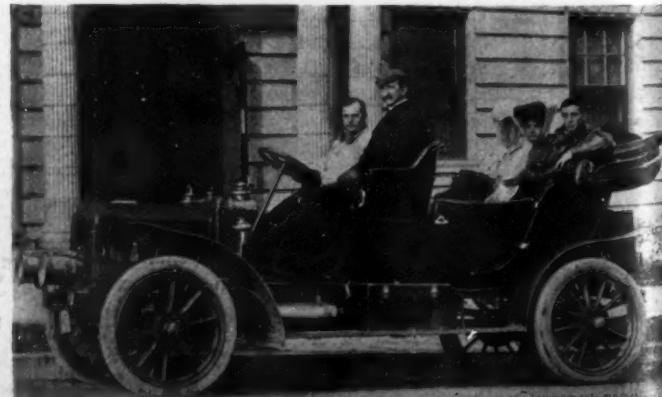
One of the surprises of the season has been sprung by the Electric Vehicle Company, of Hartford, Conn., and though the cause of it all, a new mixed-system gasoline-electric pleasure car, has been running under test for a year and a half, the news did not leak out. The new machine is an interesting and ingenious variation of the system wherein a gasoline motor drives a dynamo and the current from the dynamo is led to an electric motor which drives the rear wheels.

The dynamo, of compact design, high efficiency and wide range of speed, takes the place of the flywheel on the rear end of the motor shaft, the motor being a regular four-cylinder Columbia. Just in the rear of the dynamo, and with its shaft in approximately the same line, is an electric motor, whose shaft is coupled to the ordinary propeller shaft through which the rear axle is driven. Five forward and three reverse speeds are provided. On all except the highest forward speed the variations are effected by electrical means, there being no mechanical connection between the dynamo and the motor. On the highest speed, however, the drive is direct from the engine to the propeller shaft, the dynamo and motor rotating merely as flywheels idly. The electric controller is manipulated through a hand lever of the ordinary type. Barring the addition of the electrical equipment and the removal of the flywheel and change-speed gear box which it replaces, the car does not differ materially from the ordinary type of gasoline car; and in appearance there is nothing to indicate the mechanical arrangement—a fact that doubtless made it easy to keep the secret while testing on the road.

The system will be applied to commercial as well as to pleasure vehicles, the combination offering great possibilities in the way of heavy starting torque and simplicity of handling. The chassis of the pleasure car will cost \$7,500 and will, it is anticipated, be seen at the automobile shows.

TRYING OUT THE 1907 AUTOCARS.

ARDMORE, PA., Nov. 12.—Severe road tests have been given the 1907 machines put out by the Autocar Company, and they have upheld the reliability record of their predecessors. The new big touring car, Type XIV, was driven over 1,000 miles of hilly roads in middle and western Pennsylvania in all kinds of weather. It returned to Philadelphia in perfect condition without having suffered a single mishap. Following this run, the 1907 Autocar runabout, Type XV, was driven to Baltimore and return with an equally commendable record. The distance, 176 miles, was covered in 6 hours 45 minutes, with no punctures and no necessity for repairs of any kind. Deliveries of Autocar touring cars and runabouts to dealers will begin on November 25.



BOSTON'S POSTMASTER TAKES A RIDE IN A WHITE STEAMER.

Postmaster and Mrs. Geo. A. Hibbard, Manager and Mrs. J. S. Hatch away of the White branch, leaving Hotel Canterbury, Boston.

NEWS AND TRADE MISCELLANY.

The W. D. Strong Company, of Cleveland, O., has changed its name to the Auto Equipping Company.

The Peoria Automobile Company, of Peoria, Ill., has purchased a lot of 40 feet frontage, and will erect a building on it.

A building at the southwest corner of Fifty-first street and Twelfth avenue, New York, has been leased to the Christie Motor Car Company for a term of years.

The first four 1907 Packard Thirties have completed an aggregate mileage of 50,000 in three months in all kinds of service from demonstrating to record-breaking.

John A. Mason, of 312 Washington street, Newton, Mass., has taken up the manufacture of automobile trunks, trunk racks, tool boxes, and robe racks, and is turning out a full line of these articles.

The St. Paul Motor Vehicle Company, 184 Western avenue, St. Paul, Minn., received their first 1907 Olds touring car a few days ago, and Manager Felix Joswich states he has already sold seven cars.

The Warner Instrument Company, of Beloit, Wis., manufacturers of the Warner auto-meter for indicating the speed of automobiles, is to erect a new manufacturing building to accommodate its increasing business.

The press interests of the Importers' Automobile Salon, of New York, will be taken care of by Tom Moore, acting in conjunction with Arthur Jervis and Mr. Clinton for the coming show in Madison Square Garden.

The Davenport Automobile Company, 310-314 Main street, Davenport, Iowa, at present handling the Pope-Toledo, is in the market for additional cars—a medium-priced four-cylinder car preferred. This concern has a good central location and well-equipped garage.

The Hartford Suspension Company, of 67 Vestry street, New York, has closed a contract with the Abendroth & Root Manufacturing Company, of Newburgh, N. Y., to equip their "Frontenac" cars with Hartford shock absorbers as part of the regular equipment.

Owing to the retirement of Emil Erstberg, who has sold his interests in the Erstberg-Welch Automobile Company, of Milwaukee, the name has been changed to the Welch Bros. Automobile Company. The affairs of the concern will be managed by W. B. Johnson, of Chicago.

In last week's issue of *THE AUTOMOBILE*, page 622, in referring to the change of name of the McGiehan Manufacturing Company to the Winchester Speedometer Company, the name of the instrument manufactured—the speedometer—was misspelled "speedometer." The mistake was purely typographical.

It is announced as "The Jones Pilgrimage to New Rochelle," and it is just "45 minutes from Broadway." The function is set for Saturday night, November 17, and it all means that the Jones Speedometer factory will have a housewarming at New Rochelle, N. Y. A special train will convey the guests, starting from the Grand Central Station at 8 P.M.

The Pence Automobile Company, Minneapolis, Minn., is recommending to its customers an anti-freezing mixture which they have used for several years with complete success. The formula is: Wood alcohol, 50 per cent.; glycerine, 25 per cent.; water, 25 per cent. This mixture withstands 20 degrees below zero.

Tony Nichols, of Los Angeles, recently made a record-breaking run from Los Angeles to San Francisco, covering the distance in 21 hours 4 minutes, eight minutes better than the previous record. The trick was done with a 6-cylinder Franklin over very poor roads, and was the outcome of a wager.

The Packard Motor Car Company has issued a limited edition of the brochure of photographs taken recently in the Packard factory at Detroit. The series of views illustrate the up-to-date methods of a great concern, and the exceptional period of activity now apparent in the Detroit plant, which is busy delivering its 1907 output to agents throughout the country.

Fire destroyed the garage of the Pioneer Company, of Oakland, Cal., destroying twenty-five automobiles that were in the building, and causing a total loss of some \$150,000. This includes the loss on two houses adjoining the garage. The fire is said to have originated by an employee dropping a lighted match into a pool of water on which was floating a layer of oil.

The American Veneer Company, Kenilworth, N. J., have lately branched out in a new line, making steering wheels for automobiles. These wheels are made 3-ply of twelve sections of maple lumber for the different sizes required, and the company's capacity is 200 to 300 per day. An order for 4,000 steering wheels has been received from one concern alone. The factory is busy in all its departments, making mudguards, dashboards and limousine tops.

The Turner & Fish Company, of Chicago, manufacturers of indestructible steel wheels, will exhibit a dozen models at the coming automobile shows. Some will be equipped with well-known hubs, tires and rims of the latest patterns, and parts and sections will be shown. Another feature will be a speed rack with four wheels running at different speeds—5, 10, 20, 40 and 60 miles per hour—for the purpose of demonstrating the appearance of the wheels under all conditions.

The six-ton truck now nearing completion in the Winton factory will be displayed at the New York show, but prior to that time it will be submitted to many severe tests, one of which will probably be that of carrying a full load under its own power over the rough January roads from Cleveland to New York. This big truck has a platform space of 98 square feet and is equipped with regular Winton motors. The Winton company has used trucks of its own manufacture for five years past and has also supplied service wagons to the government.

The Lozier Motor Company has announced that with the exception of Pittsburgh and Los Angeles, agency negotiations for which are now pending, no new agency contracts will be placed for 1907, as the number of Lozier cars available for agency allotments have been assigned and the balance of the output will be sold at retail from the New York salesrooms. Therefore the only Lozier agencies for 1907, outside

of New York City, are as follows: Boston and Springfield, Mass.; Philadelphia, Chicago, St. Louis, San Francisco, Cincinnati, and Columbus, O.

Among the particularly interesting foreign cars that will be seen at the January show in Madison Square Garden will be the new six-cylinder 60-horsepower Fiat for 1907, an advance model of which is now being tested on the roads about Turin, Italy, by C. H. Tangeman, president of the Hol-Tan Company, of New York, and Emanuel Cedrino, the company's mechanical expert. Mr. Tangeman sends enthusiastic reports regarding the speed, power and simplicity of the car, laying particular stress on the latter feature. While the 60-horsepower car will have six cylinders, the 20-horsepower and the 35-horsepower models will have four cylinders as heretofore.

With an automobile as a prize for good work a salesman is likely to put his best foot foremost—especially if the car is one that is particularly well worth winning. There is a great stir among the salesmen of the National Cash Register Company, which has offered no less than six four-cylinder runabouts as prizes for the six highest scores made among its 492 American salesmen. The field has been narrowed down to 48 men, and the business that is rolling in as a result of the competition is more than paying for the \$9,000 spent for the machines. The cars are four-cylinder Stoddard-Dayton runabouts of 15-18 horsepower and were selected by the N. C. R. Co. after careful consideration.

Next to flying is a ride in the Ford 4-cylinder runabout, according to Roy Knabenshue, the airship navigator, who ordered a runabout at the New York show last winter, and received it at the Detroit factory recently. Disdaining to take even one lesson in operating the car, Knabenshue started from the Ford factory in Detroit for a run to Toledo, his home town. He was accompanied by his wife. It began to rain just as the pair left the factory, but they drove on to their destination. The road between Toledo and Detroit is notoriously bad, and in rainy weather is considered almost impassable, the clay having a consistency of glue mixed with grease.

NEW AGENCIES ESTABLISHED.

Reo cars will be sold in Holdrege, Neb., next spring by C. R. Livingston.

Wayne agencies have been secured by G. O. Walters, of Long Beach, Cal., and S. P. Toomey, of Pomona, Cal.

The Graygood hydraulic shock absorber will be handled by E. D. L. Saunders, as New England agent. An office will be opened shortly in Boston.

For the coming year the Peerless cars will be handled in Chicago by the Northern Motor Car Company, at 1400 Michigan avenue, in addition to the Northern.

The Pence Automobile Company, Minneapolis, Minn., has added the Pierce-Arrow to its already strong line, which includes Packard, Stevens-Duryea, Buick, and Autocar.

The Lord Motor Car Company, a new Los Angeles concern, will handle the Cleveland and Mason automobiles and the Harley Davidson motorcycle. The location is 1044 South Main street.

Friction drive will be represented for the first time in Los Angeles by the Carter-

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Novem

car, which will be handled by the Occident Motor Car Company, of 2731 Pico street, of which S. Cole is president and manager.

Frank Steinhauer will be sales agent for the Reo cars in Atlanta, Ga., for the coming year. Mr. Steinhauer, who is one of the best known Southern salesmen, will locate at 56 Edgewood avenue, that city.

The Haynes agency for New Haven, Conn., has been secured by the Reichert Automobile Company, and that of the Maine agency for the same car will be in the hands of the Maine Motor Carriage Company, of Portland.

The Stearns car will be handled on the Pacific coast during 1907 by The Automobile Company, 365 Pell street, San Francisco, Cal. This practically completes a chain of Stearns agencies supplying every district in the United States.

The newly organized J. H. Brady Auto Company has secured a fine location at 234 Jefferson avenue, corner Randolph street, Detroit, Mich., and has taken the Peerless, Autocar, Pope-Hartford and Pope-Tribune agencies. W. J. Bemb, formerly Detroit branch manager of the Ford Motor Company, is associated with Mr. Brady in the active management of the business.

N. C. & C. D. Castle, Massachusetts representatives of the Lozier, who have leased the store on the corner of Boylston and Gloucester streets, Boston. The Castle brothers have represented the Lozier car in the western half of the State, and are prominently identified with the trade in that section, having been for a number of years past connected with the White interests at Springfield. Through the opening of the Boston store they have acquired the Lozier rights in the eastern half of Massachusetts, and from the Boston and Springfield stores now control the entire State. The new Lozier store on Boylston street is one of the best locations on the row, and is splendidly adapted for the sale of a car of the Lozier class. It is fitted with an elevator, and in the basement is a turntable, washstand, and appliances for storage and repairing of cars.

TRADE REMOVALS.

The Michigan Storage Battery Company has removed from 211 Jefferson avenue to 24 Atwater street, East, Detroit, Mich., larger quarters having become necessary.

The Bay State Automobile Company has discontinued its salesroom formerly at 1008 Boylston street, Boston, and has equipped a suitable space at its factory, 112 Norway street, Boston, for exhibiting the new "Bay State Forty" car.

The Mercedes Import Company, of New York, has leased the premises at 590 Fifth avenue, and will open a new salesroom early in the year, with garage accommodations near by for its customers, removing from its present location in the Times Building, Times Square.

PERSONAL TRADE MENTION.

Vice-President Thomas Henderson, of the Winton Motor Car Company, is in London, attending the Olympia show, where the company has an exhibit.

A. W. Church, of Wyckoff, Church & Partridge, of New York, has returned from Oklahoma, where he has been for the last two weeks on a hunting trip.

Walter Clapp, of Boston, has been appointed New England manager for the

Continental Tire Company. Mr. Clapp has been identified with the Boston Rambler branch for two years.

George M. Wheeler has resigned as manager of the Kansas City Motor Car Company, and accepted a similar position in the automobile department of the Columbus Buggy Company, Columbus, O. Mr. Wheeler is an electrical and mechanical engineer, and has had a wide range of experience in the automobile trade.

Paul L. Snutsel, of the Snutsel Auto Supply Company, will sail on Thursday of this week for Europe, where he will make arrangements for a number of new agencies and secure samples of the coming season's novelties for this country. In addition to this, Mr. Snutsel will visit his father, Victor Snutsel, one of the directors of the Société Belge Construction Automobile, makers of the Pipe cars. Mr. Snutsel will be away for three weeks.

A. J. Picard has joined the selling force of Wyckoff, Church & Partridge, of New York, and will have charge of the department of their business devoted to the sale of the Stearns car. Mr. Picard is a veteran in the automobile business, having been sales manager for the late F. A. LaRoche, of the Darracq Company. After the death of Mr. LaRoche, he was associated with the Walter Company and more recently has been sales manager for the Rainier Co.

I. C. Kirkham, who has had charge of the export business of the Maxwell-Briscoe Motor Company, has in addition become the exclusive distributor for Long Island of Maxwell cars, and has taken charge of the garage at Bedford Avenue and Fulton street, Brooklyn. Mr. Kirkham has been connected with the Maxwell Company for nearly three years, and will be remembered as the driver in the 1905 Glidden Tour and the 1906 event of the Maxwell two-cylinder car known as "Old 41."

THE MORTUARY LIST.

William Bowe, head of one of the largest automobile establishments in Delaware, died last Wednesday at his residence in Wilmington, aged 70 years. He was president of the Bowe Carriage Company, which, a few years ago, added an automobile feature to the plant and since that time the automobile end has been one of the principal parts of the business. While he built carriages in their entirety, the automobile work was largely in the nature of repairing and providing new woodwork. He was one of the most prominent men in the city, being very wealthy, and a director in the Farmers' Bank and also the Equitable Guarantee and Trust Company. His establishment was one of the largest of the kind in this section.

TRADE LITERATURE RECEIVED.

CHICAGO PNEUMATIC TOOL CO., Fisher Building, Chicago.—Finely illustrated catalogue of Franklin air compressors for factory equipment. Full tabular specifications given.

MUNN & COMPANY, 361 Broadway, New York.—Large and complete catalogue of scientific and technical books for 1906 and 1907, covering practically the whole field of arts and sciences.

R. H. SMITH MANUFACTURING COMPANY, Springfield, Mass.—Illustrated catalogue giving detailed description of the Springfield Motormeter, together with illustrations and prices of all component parts and directions for installing the instrument.

RECENT INCORPORATIONS.

Auto Engineering Company, Detroit, Mich.; capital, \$5,000.

Dolson Automobile Company, Charlotte, Mich.; capital stock increased from \$100,000 to \$300,000.

Murilla Motor Car Company, Marion, Ind.; to manufacture automobiles, engines and tools. W. M. Meyers, president.

Jencock Motor Manufacturing Company, Port Chester; capital, \$50,000. Directors, L. C. Mertz, and W. N. Slater, Port Chester.

Success Auto-Buggy Manufacture Company, St. Louis; capital, \$10,000. Incorporators, John C. Higdon, E. E. Higdon and Robert Horne.

Victor Auto Tire Repair Company, Passaic; capital, \$30,000. Incorporators, Victor E. Butler, Allen M. Chalmers, Cornelius Post, and James Maitland.

Cornish-Friedberg Motor Car Company, Chicago; capital, \$5,000. Incorporators, Frederick W. Cornish, Charles Friedberg and Louis W. Friedberg.

Mercedes Repair Company, New York; capital, \$30,000. To repair automobiles. Directors, Henry Hitchenbach, A. C. Beckert and W. T. Suttgen.

Hibbard Automobile Company, Milwaukee, Wis.; capital stock, \$10,000. Incorporators, Jacob Raffauf, Alexander E. Raffauf and William L. Hibbard.

Camp Brothers Auto Touring Company, New York; capital, \$50,000. Directors, F. L. Camp, A. R. Camp, New York, and V. F. Camp, Bayshore, L. I.

Motor Car Heater Company, Chicago; capital, \$2,500. To manufacture automobile accessories. Incorporators, W. C. Lewis, Helen E. Robin, and J. L. Brouse.

Rambler Garage Company, Chicago; capital, \$2,500. To repair, store, and hire motors. Incorporators, Edward J. Batelme, Effie M. Abel, and Edith S. Frankle.

H. G. Wilcox Motor Car Company, Minneapolis, Minn.; capital, \$100,000. Incorporators, John F. Wilcox, H. E. Wilcox, Ralph D. Wilcox and Maurice Wolf.

The Auto-Armor Company, Manhattan. To manufacture automobiles and carriages; capital, \$100,000. Incorporators, M. M. Mills, E. H. Converse and F. P. Hayes.

Hurck Motor and Cycle Company, St. Louis, Mo.; capital stock, \$5,000. Incorporators, John Hurck, Alfred J. Carpenter, Maud Hurck, and Mary H. Carpenter.

Motor Car Repair Company, New York City; capital, \$20,000. To manufacture motors, etc. Incorporators, P. A. Proal, E. M. Dalley, and L. C. Dalley, New York.

The Welch-Estburg Company, Milwaukee, Wis.; an amendment changing its name to the Welch Bros. Motor Car Company and increasing its capital from \$50,000 to \$75,000.

Palace Garage Company, Millbrook, N. Y.; capital, \$75,000. To maintain a garage and deal in automobiles. Incorporators, H. S. Gould, F. A. Fox, M. Whennitt, F. Komp and A. M. Von.

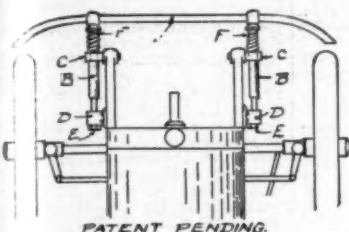
Pietsch Automobile Company, Chicago; capital, \$30,000. To manufacture automobiles, machinery and launches. Incorporators, Laurence W. Pietsch, Edward A. Becker, and Carlos J. Ward.

The Hager Carburetor Company, Nashville, Tenn.; capital, \$15,000. To manufacture automobile attachments and accessories. Incorporators, Frank W. Hager, Duncan F. Jenner, Charles C. Coddington, C. S. Brown and C. C. Gilbert.

THE AUTOMOBILE.

INFORMATION FOR BUYERS.

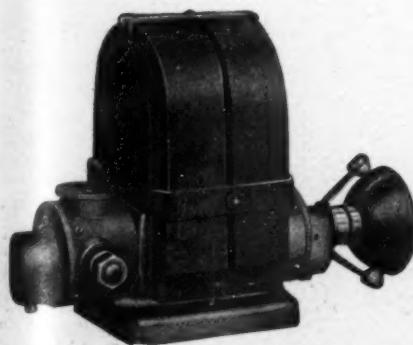
HARROUN AUTOMOBILE BUMPER. — No matter how carefully a man may drive, he is liable at some time or other to make a mistake and butt into a doorpost or a garage wall; and even if he should be so cautious as to escape this, he may be backed into by some horse-drawn vehicle, to the damage of his lamps and radiator, if nothing worse. The Harroun bumper, illus-



DETAILS OF THE HARROUN BUMPER.

trated herewith, is intended to protect the front part of the car from just such accidents, and to remove the burden of unnecessary care from the shoulders of the driver. The bumper consists of a curved main member *A*, placed forward of the foremost attachment—usually the lamps—and having two backwardly extending arms *BB* for its support. The arms pass through eye-bolts and are supported by brackets *CC* and *DD*. Helical springs *FF* are under slight compression, just sufficient to keep the parts tight, and in case of a collision they absorb the shock transmitted backward from the main member. The arms *BB* are, of course, free to slide in their supports. Nuts *EE* are screwed up against the springs just tight enough to slightly compress them. The material used is Shelby steel tubing, the curved front member being 1 1-4 inches in diameter with 3-16-inch walls. The device is manufactured and marketed by the Turner Brass Works, of Chicago.

SLOW SPEED MAGNETO. — The advantages of a mechanical, instead of chemical, source of current for the electric ignition system of an automobile are such that the number of mechanical generators on the market is constantly increasing and in reliability and



HERCULES LOW-SPEED MAGNETO.

efficiency later machines are far ahead of earlier models. A particularly interesting direct current magneto, designed to give a large hot spark at low speed, is the Star magneto, manufactured by the Hercules Electric Company, of Indianapolis, Ind. The manufacturers state that the machine is of large proportions and constructed with a view to continuous service. The frame and base are cast

in a single piece, the material used being an imported steel of non-magnetic quality, which has much to do with the efficiency of the machine. This construction greatly reduces the number of parts used and adds strength. The armature is built up of soft steel and the commutator is of the best quality; the drive is governed by a special device which maintains a practically constant speed, regardless of engine speed, and a heavy current is generated at low speeds. The machine may be had with either Hess-Bright ball bearings or plain bearings, though the ball bearings are recommended by the builders for automobile work, as they require practically no attention, occupy very little space and reduce friction to a minimum. The Star magneto is stated to be absolutely dust and water proof. The Hercules company will send an expert to install magnetos for jobbers or manufacturers and will send magnetos to individual users, with full instructions for installation, on 30 days' trial.

CUT-OUT PEDAL. — A new cut-out pedal for operating muffler cut-outs has been placed on the market by Charles E. Miller, of 97 Reade street, New York. The illustra-



MILLER'S DIAMOND CUT-OUT PEDAL.

tion shows the pedal clearly; the material used is yellow brass, and the pedal is given a high polish for a finish. It may also be used for operating signal horns blown by exhaust pressure. The same brass is used in making brackets for carrying extra tires. The pedal is known as the Diamond pedal and is manufactured by Mr. Miller.

OIL GUNS. — Handy guns for unhandy places are the specialty of the Randall-Faichney Company, of Sudbury Building, Boston, Mass. This concern manufactures the B-Line oil guns and these are made without the use of cork, leather or other piston packing. One of the oil guns is made specially for handling oils and greases of all kinds—any grease can be handled, no matter how heavy. This is accomplished by having the plunger rod threaded and on the rod is a nut which simply acts as an ornament on the rod as long as the gun is used for oils or light lubricants. When it is desired to use heavy grease, however, the nut is brought against a nipple on the pump cover and screwed over it. There is now no way of moving the plunger except by screwing the rod up or down through the nut, and this gives ample power to handle anything that will go into

the gun. This is only one of the many forms manufactured by the concern.

AN AUTO CLEANER. — Under the name of Cleanola the Cleanola Company, of Allegheny, Pa., has placed on the market a compound for brightening and cleansing the varnish and paint work of automobiles

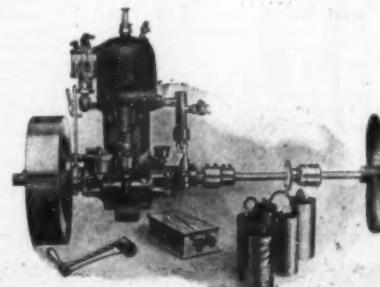


and similar work. It is also said to be a good cleaner and freshener for the leather coverings of the seat cushions. Being a neutral compound, it will not injure either the varnish or the hands of the user; it has no disagreeable odor and will not collect dust. In using, the mud and dirt are washed off the car in the usual way, and then the Cleanola is applied with a soft cloth and polished off with another dry, soft cloth. The compound is put up in cans containing from 6 ounces to 1 gallon, and in barrels and half barrels. The Cleanola trade-mark is reproduced herewith.

NEW MARINE MOTOR. — In the accompanying illustration is shown the 2-horsepower two-cycle marine motor manufactured by the Lockwood-Ash Motor Company, of

Jackson, Mich., incorporated. The complete outfit shown is included in the price of the engine, but it may be purchased, at a reduced figure, without propeller, ignition apparatus and so on, so that the purchaser may attach such accessories as he may desire.

The following are the specifications of the motor: Length of crankshaft, 15 inches; width of base, 9 1-2 inches; height from center of shaft to top of cylinder, 13 inches; main bearings, 3 inches long and 1 1-3 inches in diameter; crankpin bearing, 1 1-3 by 1 1-2 inches; cylinder bore, 3 1-4 inches; stroke, 3 1-2 inches; diameter of flywheel, 12 inches; speed, from 200 to 1,600 revolutions a minute. The connecting rod is of bronze and the bearings of babbitt. The weight of the motor is 100 pounds, and the rated power, 2 horsepower, is developed at 800 revolutions a minute. All the parts are made to jigs and templates and are therefore interchangeable. Crankshaft is made from a steel forging and the bearing metal is nickel babbitt. The price of the



LOCKWOOD MARINE MOTOR.

engine and complete outfit, ready to install in boat, is \$55; the "bare engine" is listed at \$42.50. In addition to the motor illustrated the same company builds a 5-horsepower twin cylinder motor. Both were designed by Fred Lockwood, whose long experience in the gas engine field has given him the experience necessary for such work. That the work was thoroughly done is shown by the statement of the manufacturers that the first motor, built two years ago, has been running ever since and is still running.

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